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AUTHOR Redmann, Donna H.
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ABSTRACT

Phase I of a study was conducted to identify the basic mathematics competencies needed for job success in office occupations (14 job clusters). It also sought to determine the differences between employees' and employer/supervisors' perceptions of the degree of importance of mathematics skills for office occupations. Following a review of literature, a preliminary list of business and office mathematics skills was submitted to an advisory committee of business teachers, field tested, and refined into a questionnaire that contained a list of 36 basic mathematics skills and 30 mathematics-related business skills. Survey forms were created and sent to 1,652 employees and 288 employer/supervisors at 58 businesses in Louisiana, with responses returned by 854 employees and 171 employer/supervisors. Tables were prepared showing ratings of mathematics skills by each of the respondent groups and by businesses by size. The most important skills cited by all respondents were adding/subtracting whole numbers, using 10-key adding machine or calculator, multiplying/dividing whole numbers, and using computer terminals for data entry and output. In only three categories (bank teller, bookkeeping/accounting clerk, and secretary) was there significant disagreement between employees and employers, according to a chi-square analysis. Most of the employees were satisfied with their mathematics preparation in school. The findings from the study were used as the basis for the development of a curriculum guide for Louisiana. (KC)

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Job-Related Basic Math Skills: An Analysis of Employees and Employers/Supervisors' Perception of Needed Math Skills for Office Occupations

by

Donna H. Redmann, Ph.D.

Associate Professor
Office Administration/Business Education
Southeastern Louisiana University
Hammond, Louisiana

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Introduction

Emphasis on literacy requirements has become a national issue as well as a local one. The 1987 Phi Delta Kappa/Gallup Poll of Public's Attitudes Toward Public Schools focused on the educational policies of the Reagan Administration over the past six years. This national survey reported that the public perceives very little overall improvement in public schools. The public believes that student achievement has remained the same. The public responded favorably to an increased emphasis on the basics. Seventy-Five percent of the respondents felt the quality of public school would improve if students were required to take more courses in basic subjects, such as math and science, at the expense of electives. At the elementary level, only 28 percent felt enough attention was given to the three R's. At the high school level, the respondents were asked to indicate what core courses should be required of every college-bound high school student and of every student who does not plan to go college. Mathematics followed by English were perceived to be the two most important courses for all high school students. For non-college bound students, vocational training (78%) was perceived as the third most important and business education (65%) as fifth. For students planning to attend college, Business education courses were rated seventh (59%) and vocational training was rated 11th (31%). (Gallup & Clark, 1987)

The need for math instruction is further supported by a followup study of 1,296 dropouts and graduates of the class of 1981 from 19 high schools

throughout Oregon. Both vocational and non vocational students participated. Over half wished they had taken more math and 38 percent of both groups wished they had taken more science. A third of the students recommended requiring three years of math for high school graduates; 20 percent recommended a three-year science requirement. (Owens, 1985)

In recent years educators and policymakers have raised the graduation requirements in basic academic subjects for all students. Basic academic competencies in communication, math, and science are fundamental to preparing students for further learning as well as for employment. Persons who lack basic skills will remain in dead-end jobs and will be unable adjust to technological changes. Educators are faced with a diversity of ability levels, interests, and future plans among secondary students. Vocational education can play an important role in addressing this diversity among students. In response to the need to improve the quality of education, the Southern Regional Education Board's Commission for Educational Quality made ten recommendations for improving secondary vocational education. The first recommendation was that students in vocational programs should meet the same basic skills standards on high school competency tests as any student seeking graduation. Another recommendation was that applied math and science courses should integrate occupational applications into the curriculum. Basic skills remedial instruction should be provided to poorly prepared vocational students. (Southern Regional Education Board, 1985)

Policymakers, educators, and parents are not the only ones who are concerned about the declining literacy level of the average American. Business and industry are becoming actively involved. A small but growing number of companies are offering their employees training in basic communications and math skills. The philosophy behind this movement is that

only an educated work force can keep up with changing technology. Increasingly, companies are offering classes to make sure their employees can read instructions and operate equipment. The following is what some companies are doing about the literacy gap:

- General Motors has placed learning centers near assembly lines. These centers offer basic-skill training programs in cooperation with the public schools.
- Planters provides on-site remedial-education classes for workers in Suffork, Va. These classes meet before and after shifts.
- Polaroid offers technology-readiness programs which teach everything from remedial education to higher math and science. One-third of the company's 10,000 employees are enrolled.
- Southland Corp.'s programs help immigrant employees of 7-Eleven Stores improve both English and cultural skills.
- AT&T and the Communications Workers of America have set up a joint company to finance worker education and training.
- Blue Cross Blue Shield provides on-the-job training which includes instruction in the three R's.

(Copeland, 1987)

The need for academic skills training as an integral part of vocational training has been voiced by leaders in business, industry, and education, as well as by the general public. This concern has been addressed in the Carl D. Perkins Act of 1984. One of the legislative provisions encourages the

strengthening of the academic foundations of vocational education through the conduct of special courses and instructional strategies for teaching principles of math and science via practical application (Sec. 251, (11)).

Purpose of Study

Since math instruction incorporated into business and office occupational training programs will reinforce and enhance the basic academic skills of vocational students, a research and curriculum development project was funded with state administered federal funds from the Perkins Act. The purpose of this project, which was sponsored by the Louisiana State Department of Education, was to develop a math curriculum guide for Business and Office Education. The project was conducted in two phases. Phase I involved a survey of the business community to identify the math competencies needed for job success in office occupations. The results of the survey were used in Phase II as the bases for the development of a competency-based business math curriculum guide.

The purpose of this paper will be to discuss the research activities involved in Phase I of this project. The methodology employed will be covered as well as the results of the survey.

Objectives of Phase I

The main objective of Phase I was to identify the basic math and business-related math needed for success in fourteen major office occupations. The specific objectives were to:

1. Identify the generic competencies needed by all office workers for the fourteen job clusters.
2. Identify the specific competencies needed for each of the fourteen

job clusters.

3. Determine if there is a difference between the perception of employees and the perception of employer/supervisors in the degree of importance of math skills for the given occupations.
4. Identify employers/supervisors' level of satisfaction with the math performance of their office workers.
5. Determine employees' level of satisfaction with their math performance on the job.
6. Identify employees' level of satisfaction with math preparation received in school.

Review of Literature

The competency-based approach to curriculum development has become a common practice in vocational education. Several studies have been conducted to identify the basic skill requirements in vocational education programs. The majority of the studies involved surveying vocational education teachers to determine job competency. The two most extensive and comprehensive of these studies were done by Thomas E. Long (1973) and by James P. Greenan (1983). A few studies have been conducted that actually survey incumbent workers to identify basic skill requirements (Fairchild, 1982; Hall, 1974; Koopika, 1980; and Smith, 1979). In the area of Business Education, the identification of necessary basic skills was included with the identification of job entry-level competencies. One study dealt directly with the literacy requirements of a specific office occupation (Moe, 1979). The review of literature revealed a need to survey office workers to determine the math competencies for a broader spectrum of job categories.

Methodology

Development of Questionnaire

Preliminary List of Competencies. A preliminary list of math competencies for Business and Office occupations was formulated after examining many available documents and resources. The sources include the following:

Dill, C., & Weitman, K. Business lab curriculum. Final report. Olympia, WA: Washington State Commission for Vocational Education. 1983.

Fairchild, P., & Gilligan, J. Wyoming business and office occupations survey for entry-level employment competencies. Cheyenne, WY: Wyoming State Department of Education. 1982.

Florida Department of Education. Level IV competencies for business education, Volume I: Learning manager's guide. Tallahassee, FL. 1982.

Greenan, J. P. Generalizable mathematics skills assessment. User Manual. Urbana, IL: Illinois University, Dept. of Vocational and Technical Education. 1984.

Greenan, J. P. Identification of generalizable skills in secondary vocational programs. Urbana, IL: Illinois University, Dept. of Vocational and Technical Education. 1983.

Hall, G. A comparative study of specific skill requirement of selected employers and clerical course content in a community college district. Fort Lauderdale, FL: Nova University. 1974.

Koopika, B. Identification of mathematics competencies for vocational, technical and adult education through a survey of

employer/incumbent employee expectations. Green Bay, WI: Northeast Wisconsin Technical Institute. 1980.

Long, T. E. Determination of the basic mathematics skill needs and the need for mathematics remediation for secondary vocational education students. University Park, PA: Pennsylvania State University, Dept. of Vocational Education. 1973.

Montana State Department of Public Instruction. Business education curriculum guidelines. Helena, MT. 1983.

Smith, A. D. Generic skills. Keys to job performance. Ottawa, Ontario: Canadian Commission of Employment and Immigration. 1979.

South Carolina State Department of Education. Applied vocational mathematics. Columbia, SC. 1984.

Wyoming State Department of Education. The Wyoming business education standards of excellence handbook. Revised. Cheyenne, WY. 1984.

Design of the Survey Instrument. From this review of literature, the preliminary list of Business and Office math skills was submitted to an advisory committee, composed of master Business Education teachers. Based on their recommendations, the preliminary list of math skills was revised and used as the basis for the survey instrument. After field testing the instrument, the final version of the questionnaire consisted of a list of 36 basic math skills and 30 math related business skills. Two questionnaire instruments were developed: one for the employees and one for their employers/supervisors. These questionnaires asked incumbent office workers and employers/supervisors to rate the importance of each math skill to a given occupation. A three point rating scale was used, with 1 = not

important, 2 = somewhat important, and 3 = very important. The respondents were directed to select one of the 14 job clusters that best described their position or the types of employees under their supervision. A fact sheet on the major types of jobs was provided. The U. S. Department of Labor's Occupational Outlook Handbook, 1986-87 Edition, served as the source for these 14 job clusters. The 14 clusters were: bank teller, bookkeeper & accounting clerk, computer & peripheral equipment operator, data entry keyer, mail carrier & postal clerk, receptionist, reservation & transportation ticket agent & travel clerk, secretary, statistical clerk, stenographer, teacher aide, telephone operator, traffic-shipping-receiving clerk, and typist.

Administration of the Questionnaires.

Employers, managers, and personnel directors were contacted at 58 businesses by telephone and asked to participate in the study by distributing the questionnaires to their office employees and supervisors. These contact people were very cooperative and felt this type of study was needed. Based on the contact person's actual count or estimate of the number of office workers and supervisors, the project staff hand delivered or mailed the two types of questionnaires to each contact person. The respondent was directed to complete the questionnaire on a voluntary basis and to return it to the contact person listed in the cover letter. The questionnaires were picked up by the project staff or mailed to the project by the contact person. The contact persons were asked to return all questionnaires, including blanks and non-distributed copies. A total of 1,652 employee and 288 employer/supervisor questionnaires were distributed. Teacher aides were not surveyed because a substantial number of respondents could not be located.

Thank you letters were sent to each contact person and in some cases to the corporate officer.

Results

Returned Questionnaires

The number of completed employee questionnaires was 854 and employer/supervisor was 171, representing 47 firms. The response rate was 51.7% and 59.4% respectively, with an overall response rate of 52.8%. Table 1 provides a breakdown of the return rate which includes the number of completed and unused questionnaires received as well as the number of questionnaires not received.

Tables 2 and 3 list the number of questionnaires received for each job description category by firm size. Firm size is based on the total number of employees. A small size firm is defined as 1-199 employees, a medium size as 200-499 employees, and a large firm as 500 or more employees. The largest number of employee questionnaires were received from large firms (57.9%), followed by small firms (27.6%), and medium size firms (14.5%). The bookkeeper and accounting clerk job category represented the largest number of completed employees questionnaires (23.7%), the secretary category was second (18.4), and bank tellers third (11.2%). Half (50.9%) of the employer/supervisor questionnaires were from small firms, 36.8% from large firms and 12.3% from medium size firms. The secretary job category represented the highest number of completed employer/supervisor questionnaire (23.4%), the bookkeeping category was second (14.6%), and bank tellers third (14.0).

Table 1

Questionnaire Rate of Return

Type	Total Number Sent	Number of Completed Questionnaires Returned	Number of Unused Questionnaires Returned	Number of Questionnaires Not Returned	Return Rate Based on Number of Completed Questionnaires Compared to Number Sent	Return Rate Based on Number of Completed Questionnaires Compared to Number Actually Distributed
1. Employee	1,652	854	141	657	51.7%	56.5%
2. Employer/ Supervisor	288	171	14	103	59.4%	62.4%
	1,940	1,025	155	760	52.8%	57.4%

Table 2

Number of Employee Questionnaires Received by Each Job Description Category and by Firm Size

Job Description Category	Total Number Received		Number Recieved by Firm Size[1] Small (1-199)		Medium (200-499)		Large (500 & over)	
1. Bank Teller	96	11.2%[2]	64	66.7%[3]	10	10.5%[3]	22	23.2%[3]
2. Bookkeeping	211	24.7%	36	17.1%	39	18.6%	136	64.4%
3. Computer Operator	24	2.8%	3	12.5%	5	20.8%	16	66.7%
4. Data Entry	63	7.4%	17	27.0%	8	12.7%	38	60.3%
5. Postal Clerk	35	4.1%	14	40.0%	11	31.4%	10	28.6%
6. Receptionist	29	3.4%	14	48.3%	2	6.9%	13	44.8%
7. Reservation	18	2.1%	4	22.2%	1	5.6%	13	72.2%
8. Secretary	156	18.4%	61	39.1%	13	8.3%	82	52.6%
9. Stat Clerk	75	8.8%	4	5.3%	12	16.0%	59	78.7%
10. Steno	22	2.6%	3	13.6%	2	9.1%	17	77.3%
11. Telephone Operator	40	4.7%	2	5.0%	10	25.0%	28	70.0%
12. Shipping Clerk	44	5.1%	5	11.6%	3	7.0%	36	81.8%
13. Typist	18	2.1%	1	5.9%	1	5.9%	16	88.8%
14. Other	23	2.7%	8	34.8%	7	30.4%	8	34.8%
	854	100.0%	236		124		494	
	100%		27.6%		14.5%		57.9%	

Notes:

[1]Firm size is based on the total number of employees.
[2]The percentage of questionnaires received for each job category.
[3]The percentage of questionnaire received by firm size per job category.

Table 3

Number of Employer/Supervisor Questionnaires Received by each Job Category and by Firm Size

Job Description Category	Total Number Received		Number Received by Firm Size[1] Small (1-199)		Medium (200-499)		Large (500 & over)	
1. Bank Teller	24	14.0%[2]	20	83.3%[3]	0	.0%[3]	4	16.7%[3]
2. Bookkeeping	25	14.6%	14	56.0%	6	24.0%	5	20.0%
3. Computer Operator	10	5.8%	5	50.0%	1	10.0%	4	40.0%
4. Data Entry	8	4.7%	4	50.0%	1	12.5%	3	37.5%
5. Postal Clerk	14	8.2%	9	64.3%	2	14.3%	3	21.4%
6. Receptionist	3	1.8%	2	66.7%	0	.0%	1	33.3%
7. Reservation	7	4.1%	2	28.6%	0	.0%	5	71.4%
8. Secretary	40	23.4%	23	57.5%	7	17.5%	10	25.0%
9. Stat Clerk	10	5.8%	0	.0%	2	20.0%	8	80.0%
10. Steno	7	4.1%	0	.0%	0	.0%	7	100.0%
11. Telephone Operator	2	1.2%	0	.0%	2	100.0%	0	.0%
12. Shipping Clerk	8	4.7%	2	25.0%	0	.0%	6	75.0%
13. Typist	1	.6%	0	.0%	0	.0%	1	100.0%
14. Other	12	7.0%	6	50.0%	0	.0%	6	50.0%
	171	100.0%	87		21		63	
		100%		50.9%		12.3%		36.8%

Analysis of the Data

The responses received from the completed questionnaires were analyzed to determine which math skills were generic to all job categories and which were specific or unique to each category. The mean of the ratings, based on the importance scale of 1 to 3, was calculated for each skill for each job category. The higher the mean rating, the more important the math skills was perceived as important.

Comparison of Responses. Appendices C and D provide the comparison of the responses received from the fourteen groups of employees and employers/supervisors concerning the importance of math skills performed in office occupations. For each math skill listed on the questionnaire, fifteen sets of figures are provided. The first set of figures supplies the mean importance rating (M) based on the total number of respondents (N), and the rank (R) of each item based on the mean importance ratings (in other words, an indication of which tasks were perceived to be most important to office occupations). The same information is provided for each of the fourteen job categories. In addition, the F-ratio is provided for each item to indicate the degree of variance among the responses made by the different job groups of respondents. Based on this one-way analysis of variance and the Duncan test of significance, Appendices C and D include a listing of those math skills for which a significant difference appeared among the responses made by the fourteen job categories of office employees and employers/supervisors at the .05 level of significance or better.

Also provided in Appendices C and D is an indicator of where significant differences were found among the mean importance ratings as reported by the various groups of respondents. Pairs of ratings that were significantly different are identified by the numbers in parentheses appearing below the

mean rating (1 = Bank Teller, 2 = Bookkeeper, 3= Computer Operator, 4 = Data Entry Keyer, 5 = Postal Clerk, 6 = Receptionist, 7 = Reservationist, 8 = Secretary, 9 = Stat Clerk, 10 = Stenographer, 11 = Telephone Operator, 12 = Shipping Clerk, 13 = Typist, and 14 = Other). For example, on item 1 in Appendix C, the mean ratings for Bank Teller (2.971) and Bookkeeper (2.8863) were significantly higher than the mean ratings for Computer Operator (2.5000), Data Entry (2.5484), Receptionists (2.5172), Secretary (2.6346), Steno (2.5455), Telephone Operator (2.6250), Typist (2.5000) and Other (2.4783) at the .001 level of significance; but not significantly different from the other four job categories. Since this first math skill had received mean ratings from all fourteen groups of 2.4000 or higher it appears that this skill is important to all groups, with slightly varying degrees of importance.

Math skills which had the highest degrees of disagreement among the groups of office employess were skills 31, 33, 34, 53, 54, 56, 59, 63. Solving problems involving distance (item 34) received a low mean rating of importance from all groups except for reservationist which gave an importance rating of 2.3889. From this type of information it can be concluded that skill 34 is unique to reservationists. Solving problems of length, width and/or height (item 31) appeared to be somewhat important to postal clerks, reservationists, and shipping clerks.

The Rank Order of Math Skills. Based on the information in Appendices C and D, Tables 4 and 5 were prepared. The math competencies were rank ordered according to the degree of importance as indicated by the respondents. The data analysis on the importance of the math skills was combined into a priority index for each job category. Those math skills that received a mean rating of 2.5000 or higher are marked by one asterisk, and those math skills

Table 4

The Rank Order of Math Skills by Mean Ratings as Reported by the Employees

Rank Order	Total N=854	Bank Teller N=96	Bkk/Acct N=211	Computer N=24	Data Entry N=63	Postal N=35	Recept. N=29	Reservation N=18	Secretary N=156	Stat Clerk N=75	Steno N=22	Telephone N=40	Shipping N=44	Typist N=18	Other N=23
1	1*	1*	1*	65*	65*	1*	64*	65*	1*	1*	1*	1*	1*	65*	65*
2	64*	64*	64*	1*	1*	62*	1*	1*	64*	2*	2	2*	2*	1*	2
3	2*	65*	2*	2	64*	2*	2	2*	2*	64*	65	65	64	50*	1
4	65*	53*	65*	24	2	64*	65	64*	65	65	50	64	24	64	64
5	12	54*	12	12	50	14	12	63*	50	12	64	50	65	2	41
6	50	2	3	50	12	12	13	44*	12	3	24	16	13	41	24
7	3	59	59	64	18	24	36	40*	13	50	61	12	36	3	15
8	13	56	14	14	3	31	41	66*	3	16	32	40	12	21	40
9	14	12	13	3	16	33	14	32*	16	18	63	3	33	14	3
10	16	50	16	18	13	13	40	12*	14	13	41	13	31	15	14
11	15	66	15	15	19	36	15	41	18	14	3	14	14	24	31
12	18	58	18	36	14	66	39	36	24	40	12	15	15	53	12
13	59	37	40	25	36	15	18	34	17	19	60	21	60	60	36
14	36	14	50	21	40	32	37	43	15	15	36	32	3	32	42
15	21	3	36	60	41	60	53	21	21	36	14	37	18	12	16
16	40	13	21	61	15	50	50	13	11	21	13	36	50	13	37

Rank Order	Total N=854	Bank Teller N=96	Bkk/Acct N=211	Computer N=24	Data Entry N=63	Postal N=35	Recept. N=29	Reservation N=18	Secretary N=156	Stat Clerk N=75	Steno N=22	Telephone N=40	Shipping N=44	Typist N=18	Other N=23
17	66	38	66	17	17	3	48	3	19	17	58	66	41	18	43
18	53	15	41	13	21	34	3	18	36	24	31	17	32	16	18
19	17	36	19	7	59	65	19**	39	51	59	53	44	61	17	17
20	24	60	56	66	39	56	62**	45	10	41	59	43	11	51	11
21	19	16	7	32	37	16	17**	35	62	56	62	59	16	40	13
22	41	17	17	11	66	18	16**	14	63	53	55**	18	21	58	30
23	37	18	37	19	60	61	32**	33	32	32	21**	30	17	55	39
24	54	21	53	42	24	44	59**	60	53	37	18**	19	66	54	44
25	56	48	11	16	53	43	21**	16	40	10	51**	7	39	62	5
26	11	55	54	59	11	58	4**	19	58	66	11**	48	43	48	10
27	32	41	39	4	44	19	11**	58	55	39	40**	45	19	19	25
28	60	61	10	31	43	5	56**	53	4	43	16**	4	34	59	19
29	58	11	4	5	54	45	54**	24	37	7	19**	41	62	56	59
30	7	4	44	56	58	21	42**	11	66	11	15**	24**	37	11	21
31	10	32	45	10	45**	41	63**	31	41	60	33**	11**	7	39**	66
32	4	39	43	20	46**	10	58**	15	54	42	54**	51**	4	4**	32
33	62	19	60	6	10**	54	66**	37	7	51	43**	39**	35	5**	4
34	39	40**	58	40**	47**	17	24**	17	59	62	34**	25**	53**	37**	50

Rank Order	Total N=854	Bank Teller N=96	Bkk/Acct N=211	Computer N=24	Data Entry N=63	Postal N=35	Recept. N=29	Reservation N=18	Secretary N=156	Stat Clerk N=75	Steno N=22	Telephone N=40	Shipping N=44	Typist N=18	Other N=23
35	51	7**	5	37**	7**	11	51**	42	60	4	37**	10**	10**	61**	45
36	43	57**	55	62**	32**	4	10**	62	25	58	39**	42**	44**	36**	26
37	55	10**	38	51**	4**	51	30**	7	5	45	17**	5**	56**	10**	7
38	61	5**	48	43**	56**	25	47**	4	61	61	66**	20**	55**	43**	38
39	44	62**	51	39**	51**	30	43**	10	42**	54	42**	47**	5**	44**	20
40	5	51**	30	30**	62**	59	60**	61	56**	55	44**	46**	54**	66**	34
41	45**	24**	32	41**	61**	55	5**	52	38**	30	4**	6**	6**	7**	61
42	38**	30**	24	9**	30**	35	44**	30	6**	5**	10**	38**	45**	42**	8
43	42**	44**	42	54**	38**	7	49**	46	30**	44**	7**	56**	51**	25**	60
44	30**	45**	61	53**	48**	53	7**	48	39**	25**	57**	53**	42**	34**	46
45	48**	6**	62	52**	42**	63**	46**	59	43**	47**	45**	8**	25**	31**	22
46	25**	42**	57**	55**	52**	6*	38**	50	31**	48**	20**	31**	40**	6**	52
47	6**	43**	6**	35**	55**	20**	34**	47	20**	6**	49**	35**	58**	20**	47
48	63**	49**	25**	48**	31**	42**	31**	5	48**	46**	38**	60**	30**	45**	49
49	31**	63**	47**	44**	5**	39**	61**	51	57**	38**	25**	52**	63**	30**	51
50	57**	25**	46**	57**	20**	46**	6**	56	44**	57**	48**	54**	20**	33**	48
51	20**	8**	20**	58**	25**	26**	52**	54	45**	8**	56**	58**	59**	63**	23
52	34**	20**	49**	63**	57**	57**	25**	55	34**	34**	30**	61**	57**	47**	9

Rank Order	Total N=854	Bank Teller N=96	Bkk/Acct N=211	Computer N=24	Data Entry N=63	Postal N=35	Recept. N=29	Reservation N=18	Secretary N=156	Stat Clerk N=75	Steno N=22	Telephone N=40	Shipping N=44	Typist N=18	Other N=23
53	33**	9**	8**	46**	6**	37**	55**	20	8*	33**	52**	55**	8**	22**	62
54	47**	52**	9**	26**	8**	47**	57**	25	52*	20**	35**	9**	38**	46**	54
55	46**	31**	52**	23**	49**	9**	20**	6	9*	9**	46**	34**	9**	38**	55
56	8**	47**	33**	8**	35**	8**	45**	38	49**	31**	47**	62**	22**	35**	56
57	52**	34**	34**	49**	33**	40**	23**	57	33**	49**	5**	57**	46**	52**	57
58	49**	46**	63**	47**	63**	48**	9*	23	26**	52**	8**	26**	47**	57**	58
59	9**	22**	31**	22**	22**	22**	35**	22**	35**	63**	22**	33**	23**	8**	6
60	35**	33**	35**	28**	9**	38**	33**	9**	47**	26**	23**	49**	48**	49**	28
61	22**	23**	22**	27**	34**	23**	22**	26**	46**	35**	9**	63**	26**	26**	27
62	26**	35**	26**	38**	23**	52**	8**	49**	22**	23**	26**	23**	52**	23**	33
63	23**	28**	23**	45**	28**	28**	29**	8**	23**	27**	6**	29**	28**	9**	53
64	27**	27**	27**	34**	27**	29**	28**	28**	27**	22**	28**	28**	29**	27**	63
65	28**	26**	28**	29**	26**	49**	27**	27**	28**	28**	27**	27**	49**	28**	29
66	29**	29**	29**	33**	29**	27**	26**	29**	29**	29**	29**	22**	27**	29**	35**

* Math skills that received a mean rating of 2.500 or higher
** Math skills that received a mean rating of less than 1.500

Table 5
The Rank Order of Math Skills by Mean Ratings as Reported by the Employers/Supervisors

Rank Order	Total N=171	Bank Teller N=24	Bkk/Acct N=25	Computer N=10	Data Entry N=8	Postal N=14	Recept. N=3	Reservation N=7	Secretary N=40	Stat Clerk N=10	Steno N=7	Telephone N=2	Shipping N=8	Typist N=1	Other N=12
1	1*	1*	64*	65*	1*	1*	65*	32*	1*	2*	18*	50*	1*	19*	1*
2	64*	64*	1*	61*	65*	62*	2*	65*	2*	1*	1*	64*	2*	65*	2*
3	2*	2*	2*	64*	2*	2*	64*	64*	64*	64*	64*	65*	65*	2*	64*
4	65*	12*	65*	1*	64*	12*	1*	53*	65*	50*	65*	2*	64	3*	19*
5	12	53*	12*	60*	50*	64*	3	2*	12	65*	21*	1*	24	4*	18*
6	50	65*	14*	50*	3*	50	53	33*	3	3	2*	15*	50	5*	65*
7	3	54*	54*	32*	16*	14	42	36*	50	18	19*	12*	36	6*	55
8	14	59*	59	21*	39	13	39	40*	16	17	63*	13*	12	7*	11
9	18	37	15	36	44	60	14	54*	18	19	50*	14*	33	8*	24
10	15	14	50	3	12	61	17	1*	14	21	17	25*	61	9*	12
11	16	50	18	18	43	24	21	63*	15	12	3	21*	14	10*	50
12	13	58	16	66	15	3	20	58	11	36	11	32*	3	11*	60
13	36	15	13	24	41	32	16	60	51	15	55	3*	31	12*	36
14	21	16	3	7	17	55	43	61	13	61	14	11*	41	13*	51
15	17	3	21	15	21	15	12	44	21	55	16	18*	32	14*	5
16	19	13	61	16	7	16	15	34	55	16	15	16*	21	15*	3
17	59	36	53	17	40	33	40	12	17	13	12	17*	7	1*	21

Rank Order	Total N=171	Bank Teller N=24	Bkk/Acct N=25	Computer N=10	Data Entry N=8	Postal N=14	Recept. N=3	Reservation N=7	Secretary N=40	Stat Clerk N=10	Steno N=7	Telephone N=2	Shipping N=8	Typist N=1	Other N=12
18	61	48	19	2	18	59	44	62	36	14	13	19	5	16*	14
19	53	38	37	19	19	36	19	59	58	25	66	59	10	18*	59
20	11	18	58	10	42	34	11	13	63	11	24	9	60	39*	13
21	54	17	60	11	45	21	18	39	54	60	40	8	37	31*	4
22	60	66	51	14	59	7	36	50	53	51	51	22	62	36*	15
23	55	56	55	59	11	51	24	43	19	7	10	23	51	35*	20
24	58	5	11	37	24	19	66	3	24	32	32	24	19	17*	17
25	32	4	56	25	66	17	61	45	10	30	25	7	17	37*	10
26	51	60	17	12	13	58	60	41	62	66	61	26	63	38*	25
27	24	61	36	20	10	56	10	66	4	10	56	27	44	64*	16
28	10	19	39	30	14	53	59	14	59	24	7	10	4	44*	7
29	37	40	10	13	4	45	13	57	5	39	60	29	42	40*	66
30	7	7	48	56	25	10	30	56	32	4	34	30	15	30	61
31	4	30	62	51	36	11	31	31	61	5	8	31	13	26	56
32	62	41	66	43	32	31	55	55	37	41	6	6	34	32	54
33	66	11	57	40	60	54	9	11	7	42**	20	5	66**	25	53
34	5	10	32	6	62	4	7	35	60	8**	5	34	16**	34	32
35	56	21	7	57	56	43	5	52	41	9**	4	35	18**	24	40
36	41	6	4	5	51	18	58	4	25	54**	36	36	59**	23	6
37	40	55	38	58	37	44	63	7	66	37**	33	4	20**	22	37
38	39	32	24	55	38	30	52	10	56	53**	58	28	35**	21	42

Rank Order	Total N=171	Bank Teller N=24	Bkk/Acct N=25	Computer N=10	Data Entry N=8	Postal N=14	Recept. N=3	Reservation N=7	Secretary N=40	Stat Clerk N=10	Steno N=7	Telephone N=2	Shipping N=8	Typist N=1	Other N=12
39	25	39	40	39	52	20	41	20	20	59**	62	20	45**	20	41
40	20	62	41	42	53	42	51	17	48	20**	39	33	39**	33	58
41	63	24**	5	4	47	65	50	42	40	63**	53	41	40**	41	48
42	30	51**	30	9	46	5	38	18	42	56**	41	66	47**	66	39
43	38	57**	49	41	58	35	37**	16	38	52**	38	63	56**	61	63
44	48	20**	44	62	61	6	35**	15	39	45**	59	42	55**	60	57
45	42	25**	25	8	20	41	45**	19	30	58**	37	61	43**	62	31
46	44	9**	6	45	55	66	46**	46	6	40**	30	44**	11**	55	45
47	6	42**	20	31	5	25	8**	47	8	6**	54	45**	6**	50	38
48	45	31**	42	54	6	37	6**	51	31	31**	48	46**	30**	58	8
49	57	49**	45	53	8	57	49**	21	9	62**	42	48**	49**	47**	49
50	31	45**	8	44	30	8	4**	37	44	48**	9	49**	25	48**	9
51	43	44**	52**	49	33	63**	33**	5	43	47**	31	40**	22**	49**	30
52	8**	43**	46**	48	63	46**	57**	24**	57**	46**	45	47**	52**	46**	52
53	34**	8*	43**	22	54	39**	62**	48**	52**	35**	35	51**	46**	42**	35
54	33**	52**	63**	63	57	47**	47**	38**	45**	34**	47**	43**	38**	43**	34
55	9**	26**	47**	52	48**	9**	54**	30**	34**	44**	46**	55**	58**	29**	44
56	52**	63**	31**	47	31**	26**	34**	29**	49**	43**	44**	56**	57**	56**	46
57	49**	47**	34**	46	9**	40**	56**	9**	35**	57**	26**	57**	48**	57**	47
58	35**	35**	33**	35	22**	38**	32**	22**	33**	33**	43**	58**	23**	45**	62

Rank Order	Total N=171	Bank Teller N=24	Bkk/Acct N=25	Computer N=10	Data Entry N=8	Postal N=14	Recept. N=3	Reservation N=7	Secretary N=40	Stat Clerk N=10	Steno N=7	Telephone N=2	Shipping N=8	Typist N=1	Other N=12
59	46**	34**	9**	34	34**	22**	48**	25**	22**	49**	49**	39**	26**	59**	23
60	47**	46**	22**	23	49**	23**	28**	23**	47**	38**	29**	60**	53**	51**	22
61	22**	33**	35**	38	35**	27**	27**	49**	46**	29**	57**	52**	54**	52**	26
62	23**	29**	26**	33	23**	28**	29**	28**	23**	28**	28**	62**	28**	54**	43
63	26**	28**	23**	26**	28**	48**	26**	6**	26**	27**	52**	54**	27**	63**	28**
64	28**	27**	28**	28**	27**	29**	25**	8*	29**	26**	23**	38**	8**	28**	27**
65	29**	23**	27**	29**	26**	49**	23**	26**	28**	23**	22**	37**	29**	27**	29**
66	27**	22**	29**	27**	29**	52**	22**	27**	27**	22**	27**	53**	9**	53**	33**

* Math skills that received a mean rating of 2.5000 or higher
** Math skills that received a mean rating of less than 1.500

that received a mean rating of less than 1.5000 are indicated by two asterisks.

In Table 4, four math skills were found to have a mean importance rating of 2.5000 or higher by the total group of employee (N = 854) as shown in the first column of ranked items. For the individual groups of office employees 5 skills were very important to bank tellers, 4 to bookkeepers, 2 to computer operators, 3 to data entry keyers, 4 to postal clerks, 2 to receptionists, 10 to reservationists, 3 to secretaries, 3 to stat clerks, 1 to stenographers, 2 to telephone operators, 2 to shipping clerks, 3 to typists, and 1 to others. Twenty-six math skills received low ratings from the total group of office employees that of less than a 1.5000 mean rating. For the individual job category, 33 skills were ranked as "not important" for bank tellers, 21 for bookkeepers, 33 for computer operators, 36 for data entry keyers, 22 for postal clerks, 48 for receptionists, 8 for reservationists, 28 for secretaries, 24 for stat clerks, 45 for stenographers, 37 for telephone operators, 33 for shipping clerks, 36 for typists, and 1 for others.

The employers/supervisors' mean rank order of math skills is found in Table 5. The total groups of employers/supervisors (N = 171) rated the same four math skills as the office employees did with mean importance ratings of 2.5000 or higher. For the individual job categories, employers/supervisors tended to rate more skills as very important. Eight skills were rated as very important to bank tellers, 7 to bookkeepers, 8 to computer operators, 7 to data entry keyers, 5 to postal clerks, 4 to receptionists, 11 to reservationists, 4 to secretaries, 5 to stat clerks, 9 to stenographers, ~~8~~ 17 to telephone operators, 3 to shipping clerks, 29 to typists, and 6 to others. As a group, employers/supervisors perceived only 15 skills as "not important".

Table 6

Rank Order of Mean Rating for all Math Skills by All Respondents

Rank Order	All Respondents N=1024	Employees N=854	Employers/ Supervisors N=171	Rank Order	All Respondents N=1024	Employees N=854	Employers/ Supervisors N=171
1	1*	1*	1*	34	51	39	5
2	64*	64*	64*	35	61	51	56
3	2*	2*	2*	36	55	43	41
4	65*	65*	65*	37	39	55	40
5	12	12	12	38	5	61	39
6	50	50	50	39	43	44	25
7	3	3	3	40	44	5	20
8	13	13	14	41	30	45**	63
9	14	14	18	42	38	38**	30
10	16	16	15	43	42**	42**	38
11	15	15	16	44	45**	30**	48
12	18	18	13	45	48**	48**	42
13	36	59	36	46	25**	25**	44
14	59	36	21	47	63**	6**	6
15	21	21	17	48	6**	63**	45
16	17	40	19	49	31**	31**	57
17	53	66	59	50	57**	57**	31
18	19	53	61	51	20**	20**	43
19	66	17	53	52	34**	34**	8**
20	40	24	11	53	33**	33**	34**
21	24	19	54	54	8**	47**	33**
22	37	41	60	55	46**	46**	9**
23	11	37	55	56	47**	8**	52**
24	54	54	58	57	52**	52**	49**
25	41	56	32	58	49**	49**	35**
26	60	11	51	59	9**	9**	46**
27	56	32	24	60	35**	35**	47**
28	32	60	10	61	22**	22**	22**
29	58	58	37	62	26**	26**	23**
30	7	7	7	63	23**	23**	26**
31	10	10	4	64	28**	27**	28**
32	4	4	62	65	27**	28**	29**
33	62	62	66	66	29**	29**	27**

* Math skills that received a mean rating of 2.5000 or higher
** Math skills that received a mean rating of less than 1.500

For the individual job category, 26 skills were ranked as "not important" for bank tellers, 16 for bookkeepers, 4 for computer operators, 12 for data entry keyers, 16 for postal clerks, 24 for receptionists, 15 for reservationists, 15 for secretaries, 34 for statistical clerks, 13 for stenographers, 21 for telephone operators, 34 for shipping clerks, 18 for typists, and 4 for others.

In summary form, Table 6 provides the rank order of all mean ratings for all math skills by all respondents. The two groups of respondents ranked the same seven math skills as the most important. In general the employers/supervisors perceived more skills to be important than did the employees. Only 15 skills were rated as "not important" by the employers/supervisors, as compared to 26 by the employees. For all respondents, 24 skills were rated as "not important."

Correlation of Employees and Employers/Supervisors Responses. To determine whether each group of respondents agreed on the degree of importance of the math skills listed on both questionnaires, a chi-square analysis for significant differences was computed for each item for each job category. In comparing the degree of agreement between the employees and the employers/ supervisors on all 66 questionnaire items, only in three job categories did there exist any degree of disagreement according to a chi-square analysis. Table 7 lists the ten skills that received significantly different degrees of importance for the job category of bank tellers. Seventeen skills for bookkeeping and accounting clerks were found to have significant degrees of disagreement as shown in Table 8. As many as twenty-five math skills received significantly different importance ratings for the job category of secretaries (Table 9). For all the math skills

Table 7

Degree of Agreement between Employees and Employers/Supervisors on all 66 Questionnaire Items for Bank Tellers

Item No.	Math Skill	Chi-Square [1]
5.	Multiply and/or divide fractions	12.86868**
48.	Solve finance charge & annual percentage rate problems	11.44544**
16.	Round off decimals to one or more places	9.60010**
18.	Find what percent one number of another	8.63172*
36.	Mental estimation to math problem	8.62236*
15.	Divide whole numbers/decimals by 10,000, etc.	6.83336*
17.	Convert decimals to percents/ vice versa	6.58207*
12.	Add and/or subtract decimals	6.21336*
30.	Use equations or formulas to solve problems	6.10426*
2.	Multiply and/or divide whole numbers	6.03604*

Notes:

1 Chi-square computed with 2 degrees of freedom.
* Significant at the .05 level
** Significant at the .01 level

Table 8

Degree of Agreement between Employees and Employer/Supervisors on all 66 Questionnaire Items for Bookkeeping and Accounting Clerks

Item No.	Math Skills	Chi-Square[1]
61.	Maintain equipment records	24.13066***
38.	Compute simple and/or compound interest from a table	16.13259***
54.	Reconcile check records & bank statement	14.41684***
60.	Maintain inventory records	11.72606**
51.	Compute salaries & complete payroll records	11.61214**
62.	Compute postage, mailing, and/or freight charges	10.56354**
58.	Maintain petty cash & records	10.46695**
30.	Use equations or formulas to solve problems	9.65472**
53.	Prepare checks/drafts & deposits & complete checkbook register	8.49250*
21.	Average numbers	8.35434*
55.	Maintain budget records	8.22108*
12.	Add and/or subtract decimals	7.33062*
25.	Interpret line graphs, circle graphs, bar graphs & tables	6.81789*
19.	Find a number when a percent is known	6.76912*
48.	Solve finance charge & annual percentage rate problems	6.76688*
18.	Find what percent one number is of another	6.47129*
50.	Complete timecards or sheets for regular & overtime hours.	6.25649*

Notes:

1 Chi-Square computed with two degrees of freedom.
* Significant at the .05 level
** Significant at the .01 level
*** Significant at the .001 level

Table 9

Degree of Agreement between Employees and Employers/Supervisors on all 66 Questionnaire Items for Secretaries

Item No.	Math Skills	Chi-Square[1]
63	Obtain information from travel schedule	13.75265***
4	Add and/or subtract fractions	13.69208**
55	Maintain budget records	13.66432**
58	Maintain petty cash and records	13.57953**
56	Prepare balance sheet	12.49573**
9	Convert mixed numbers to improper fractions	12.29839**
54	Reconcile check records and bank statements	11.88460**
57	Prepare income statement	10.37524**
5	Multiply and/or divide fractions	10.15812**
8	Convert improper fractions to mixed numbers	9.80364**
49	Compute depreciation	9.58754**
51	Compute salaries & complete payroll records	9.06176*
36	Mental estimations	9.08693*
53	Prepare checks/drafts & deposits and complete checkbook register	8.82314*
18	Find what percent one number is of another	8.66319*
20	Use ratio to compare one value to another	8.01927*
15	Divide whole numbers and/or decimals by 10, 100, etc.	7.98206*
61	Maintain equipment records	7.91094*
11	Convert fractions to percents and/or vice versa	7.42886*

Item No.	Math Skills	Chi-Square[1]
48	Solve finance charge & annual percentage rate problems	7.30688*
7	Round mixed numbers to nearest whole number	7.01360*
59	Maintain customers' accounts	6.92442*
62	Compute postage, mailing, and/or freight charges	6.90601*
21	Average numbers	6.13241*
31	Solve problems involving length, width, and/or height.	6.02626*

Notes:

1 Chi-Square computed with two degrees of freedom.
* Significant at the .05 level
** Significant at the .01 level
*** Significant at the .001 level

listed for these three job categories, employers/supervisors rated each skill significantly more important than the employees did.

Generic/Specific Math Skills. It appears from the information presented in Tables 4 and 5 a considerable number of math skills were rated as important. A higher number of basic math skills than math related business skills was identified as generic to all job clusters. The generic basic skills concentrated on fundamental math, such as addition, subtraction, multiplication, and division of whole numbers. The three most important generic math related business skills were: using the ten-key adding machine or electronic calculator, using the computer terminals for data entry and data output, and completing time cards or sheets for regular and overtime hours. Those skills that received the lowest rating were skills related to geometry and squaring a number or finding the square root of a number.

Figure 1 lists the generic math skills as perceived by all respondents. The skills are listed in order of decreasing mean importance rating. Figure 2 provides a list of the math skills perceived as not important by all respondents. The skills that received the lowest rating are listed first.

An analysis of the specific skills needed by the different job clusters revealed that the reservationists identified 58 of the 66 as being important to their given job. At the other extreme, receptionists rated only 18 skills as being important. The remaining categories also varied in the identified number of math skills required for job success. Tables 4 and 5 list the specific math skills identified for the various job categories.

Degree of Satisfaction with Math Performance and Training

Math Performance. Employers/supervisors' level of satisfaction with the math performance of their office workers indicated a favorable response of

Figure 1

GENERIC MATH SKILLS

As Perceived by all Respondents

Highest to Lowest

Most Important (2.5 + mean rating)

1. Add/Subtract whole numbers.
64. Use ten-key adding machine or electronic calculator.
2. Multiply/Divide whole numbers.
65. Use computer terminals for data entry and data output.

Important (2.0 to 2.4 mean rating)

12. Add/Subtract decimals.
50. Compute time cards.
3. Round off whole numbers to nearest multiple of ten.
13. Multiply/Divide decimals.
14. Multiply whole numbers/decimals by 10, 100, etc.
16. Round off decimals to one or more places.
15. Divide whole numbers/decimals by 10, 100, etc.
18. Find what percent one number is of another.
36. Mental estimation.
59. Maintain customer's accounts.
21. Average numbers.
17. Convert decimals to percents/percents to decimals.

Rating Scale:	Not Important	Somewhat Important	Very Important
	1	2	3

Somewhat Important (1.6 to 1.9 mean rating)

53. Prepare checks, deposits, and complete checkbook register.
19. Find a number when a percent is known.
66. Use computer for solving math problems.
40. Compute sales tax.
24. Read a ruler.
37. Compute simple/compound interest.
11. Convert fractions to percents and percents to fractions.
54. Reconcile check records and bank statements.
41. Prepare sales slips and invoices.
60. Maintain inventory records.
56. Prepare balance sheet.
32. Solve problems involving time.
58. Maintain petty cash and records.
7. Round mixed numbers to nearest whole number.

Somewhat Important (1.5 to 1.59 mean rating)

10. Convert fractions to decimals and decimals to fractions.
4. Add/Subtract fractions.
62. Compute postage, mailing, and freight charges.
51. Compute salaries and complete payroll records.
61. Maintain equipment records.
55. Maintain budget records.
39. Compute trade and cash discounts.
5. Multiply/Divide fractions.
43. Compute cost of goods sold.
44. Compute selling price.

Figure 2

Math Skills Perceived as Not Important

by all Respondents

Lowest
to
Highest

Not Important (1.0 to 1.49)

29. Compute the volume of complex geometric solids.

27. Compute the area of complex geometric figures.

28. Compute the volume of simple geometric solids.

23. Find the square root of a number.

26. Compute the area of simple geometric figures.

22. Square a number.

35. Solve problems involving conversion between English and metric units.

9. Convert mixed numbers to improper fractions.

49. Compute depreciation.

52. Compute commission.

47. Solve mark-down problems.

46. Solve mark-up problems.

8. Convert improper fractions to mixed numbers.

33. Solve problems involving weight.

34. Solve problems involving distance.

Rating Scale:	Not Important	Somewhat Important	Very Important
	1	2	3

86.5 per cent, as presented in Table 10. The three job categories that received the lowest level of satisfaction are telephone operator (50%), shipping clerk (62.5%), and stenographer (71.4%).

The majority of the employees (96%) indicated that they were satisfied with their math performance on the job, as shown in Table 11.

Math Preparation. The employees were asked to indicate whether they were satisfied with the math preparation they received in school. Table 12 revealed that the following favorable responses were received for grades 1-8 (91.3 %), grades 9-12 (83.4 %), voc-tech (87.4%), and college (88%).

The employee profile data, Table 13, revealed that 411 of the 825 office workers were high school graduates, 135 had completed one year of college, 100 had completed two years of college, 41 had completed three years of college, 64 had four years of college training, and 41 had attended vo-tech schools.

Educational Significance

The efforts of this project implemented the policy of the Carl D. Perkins Vocational Education Act by translating the recommendations of office employees and employers/supervisors directly into curriculum material used by teachers. This should strengthen the preparation of vocational graduates in math skills needed for job success.

Development of Math Curriculum Guide. The findings from the employee and employer/supervisor survey were used as the basis for the development of the following curriculum guide for the State of Louisiana: Competency-Based Business Math, Bulletin No. 1814.

Table 10

Employer/Supervisor's Level of Satisfaction with The Math Performance of Their Office Workers

Job Category	Total Number of Responses	Yes		No	
		No.	%	No.	%
1. Bank Teller	24	21	87.5%	3	12.5%
2. Bookkeeping & Accounting Clerk	25	22	88.0%	3	12.0%
3. Computer & Peripheral Equipment Operator	10	8	80.0%	2	20.0%
4. Data Entry Keyer	8	7	87.5%	1	12.5%
5. Mail Carrier & Postal Clerk	14	11	78.6%	3	21.4%
6. Receptionist	3	3	100.0%		
7. Reservation & Transportation Ticket Agent & Travel Clerk	7	7	100.0%		
8. Secretary	40	36	90.0%	4	10.0%
9. Statistical Clerk	10	9	90.0%	1	10.0%
10. Stenographer	7	5	71.4%	2	28.6%
11. Telephone Operator	2	1	50.0%	1	50.0%
12. Traffic, Shipping & Receiving Clerk	8	5	62.5%	3	37.5%
13. Typist	1	1	100.0%		
14. Other	12	12	100.0%		
Total	171	148	86.5%	23	13.5%

Table 11

Employees' Level of Satisfaction with Their Math Performance on the Job

Job Category	Total Number of Responses	Yes No.	Yes %	No No.	No %
1. Bank Teller	93	91	97.8%	2	2.2%
2. Bookkeeping & Accounting Clerk	192	188	97.9%	4	2.1%
3. Computer & Peripheral Equipment Operator	19	19	100.0%		
4. Data Entry Keyer	58	57	98.3%	1	1.7%
5. Mail Carrier & Postal Clerk	34	32	94.1%	2	5.9%
6. Receptionist	24	23	95.8%	1	4.2%
7. Reservation & Transportation Ticket Agent & Travel Clerk	16	15	93.8%	1	6.3%
8. Secretary	139	131	94.2%	8	5.8%
9. Statistical Clerk	67	64	95.5%	3	4.5%
10. Stenographer	20	20	100.0%		
11. Telephone Operator	34	31	91.2%	3	8.8%
12. Traffic, Shipping, & Receiving Clerk	36	32	88.9%	4	11.1%
13. Typist	17	16	94.1%	1	5.9%
14. Other	19	18	94.7%	1	5.3%
Total	768	737	96%	31	4%

Table 12

Employees' Level of Satisfaction with Math Preparation Received in School

Job Category	ON[1]	Grades 1-8 (N=745)[2] Yes No.	Yes %	No No.	No %	Grades 9-12 (N=790)[2] Yes No.	Yes %	No No.	No %	Vo-Tech Schools (N=199)[2] Yes No.	Yes %	No No.	No %	College (N=326)[2] Yes No.	Yes %	No No.	No %
1. Bank Teller	96	86	97.7%	2	2.3%	82	87.2%	12	12.8%	17	89.5%	2	10.5%	25	89.3%	3	10.7
2. Bookkeeping & Accounting Clerk	211	170	93.4%	12	6.6%	175	90.7%	18	9.3%	51	96.2%	2	3.8%	71	95.9%	3	4.1
3. Computer & Peripheral Equipment Operator	24	18	85.7%	3	14.3%	14	70.0%	6	30.0%	4	80.0%	1	20.0%	9	81.8%	2	18.2
4. Data Entry Keyer	63	55	93.2%	4	6.8%	49	83.1%	10	16.9%	11	100.0%			18	75.0%	6	25.0
5. Mail Carrier & Postal Clerk	35	25	86.2%	4	13.8%	25	75.8%	8	24.2%	12	85.7%	2	14.3%	17	77.3%	5	22.7
6. Receptionist	29	16	76.2%	5	23.8%	20	80.0%	5	20.0%	5	71.4%	2	28.6%	8	88.9%	1	11.1
7. Reservation & Transportation Ticket Agent and Travel Clerk	18	11	78.6%	3	21.4%	13	76.5%	4	23.5%	2	100.0%			4	66.7%	2	33.3
8. Secretary	156	127	90.7%	13	9.3%	117	80.1%	29	19.9%	35	81.4%	8	18.6%	59	86.8%	9	13.2
9. Statistical Clerk	75	61	89.7%	7	10.3%	60	84.5%	11	15.5%	12	85.7%	2	14.3%	25	89.3%	3	10.7
10. Stenographer	22	17	94.4%	1	5.6%	15	75.0%	5	25.0%	2	66.7%	1	33.3%	7	87.5%	1	12.5
11. Telephone Operator	40	29	87.9%	4	12.1%	29	78.4%	8	21.6%	5	83.3%	1	16.7%	7	77.8%	2	22.2
12. Traffic, Shipping, & Recieving Clerk	44	31	93.9%	2	6.1%	31	86.1%	5	13.9%	8	88.9%	1	11.1%	18	100.0%		
13. Typist	18	17	94.4%	1	5.6%	14	77.8%	4	22.2%	5	71.4%	2	28.6%	10	90.9%	1	9.1
14. Other	23	17	81.0%	4	19.0%	15	71.4%	6	28.6%	5	83.3%	1	16.7%	9	90.0%	1	10.0
	854	680	91.3%	65	8.7%	659	83.4%	131	16.6%	174	87.4%	25	12.6%	287	88%	39	12.0

Footnotes:

1=the total number of questionnaires received per job category.
2=the number of responses to this educational level per job category.

Table 13

Employee Profile - Highest Level of Education Completed

Job Category	Q N[1]	Item N[2]	Grade 1-8 No.	% [3]	Grade 9 No.	%	Grade 10 No.	%	Grade 11 No.	%	Grade 12 No.	%	1 year College No.	%	2 years College No.	%	3 years College No.	%	4 years College No.	%	Vo-Tech School No.	%
1. Bank Teller	96	96	1	1.0%					4	4.2%	57	59.4%	14	14.6%	10	10.4%	5	5.2%	1	1.0%	3	3.1%
2. Bookkeeping & Accounting Clerk	211	205					1	.5%	1	.5%	106	51.7%	32	15.6%	21	10.2%	9	4.4%	17	8.3%	9	4.4%
3. Computer & Peripheral Equipment Operator	24	23									10	43.5%	4	17.4%	4	17.4%	2	8.7%			2	8.7%
4. Data Entry Keyer	63	61					1	1.6%	1	1.6%	29	47.5%	11	18.0%	9	14.8%	2	3.3%	5	8.2%	2	3.3%
5. Mail Carrier & Postal Clerk	35	35							1	2.9%	11	31.4%	7	20.0%	5	14.3%	3	8.6%	5	14.3%	3	8.6%
6. Receptionist	29	25									16	64.0%	1	4.0%	5	20.0%	2	8.0%	1	4.0%		
7. Reservation & Transportation Ticket Agent and Travel Clerk	18	17									8	47.1%	2	11.8%			1	5.9%	5	29.4%		
8 Secretary	156	152			1	.7%			1	.7%	64	42.1%	25	16.4%	25	16.4%	10	6.6%	10	6.6%	13	8.6%
9. Statistical Clerk	75	72			1	1.4%					40	55.6%	14	19.4%	7	9.7%	3	4.2%	5	6.9%	2	2.8%
10. Stenographer	22	20									11	55.0%	4	20.0%	1	5.0%			3	15.0%	5	2.4%
11. Telephone Operator	40	38									25	65.8%	5	13.2%	3	7.9%	1	2.6%	3	7.9%	1	2.6%
12. Traffic, Shipping, & Receiving Clerk	44	40			1	2.5%			2	5.0%	16	40.0%	9	22.5%	6	15.0%	2	5.0%	3	7.5%	1	2.5%
13. Typist	18	18									6	33.3	4	22.2%	3	16.7%	1	5.6%	1	5.6%	3	16.7%
14. Other	23	23									12	52.2%	3	13.0%	1	4.3%			5	21.7%	1	4.3%
	854	825	1		3		2		10		411		135		100		41		64		41	

Notes:

1 = the total number of questionnaires received per job category
2 = the total number of responses to this item on the questionnaire per job category.
3 = Percentages based on responses per job category.

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Southeastern Louisiana University
Dept. of Office Administration &
Business Education
504/549-2335

BUSINESS MATH SKILLS QUESTIONNAIRE
Employee Form

Your Name: _____

Name of Firm: _____

Address: _____

Telephone Number: _____

Job Title: _____

Please indicate size of firm, based on the total number of employees:
_____ a. small (1-199), _____ b. medium (200-499), _____ c. large (500 & over).

Purpose: We are trying to learn what business-related math skills are absolutely necessary for success in office occupations. This information will be used to develop a business math curriculum guide to be used by business education teachers in Louisiana's schools.

Job Description: Please check **one** of the following 14 job clusters that best describes your position. To assist you in identifying the job cluster that best fits your job description, a fact sheet on the major types of jobs is provided. If none of the 14 clusters listed describes your job, please check No. 15 and use the space provided to write your own description.

_____ 1. Bank Teller
_____ 2. Bookkeeper & Accounting Clerk
_____ 3. Computer & Peripheral Equipment Operator
_____ 4. Data Entry Keyer
_____ 5. Mail Carrier & Postal Clerk
_____ 6. Receptionist
_____ 7. Reservation & Transportation Ticket Agent & Travel Clerk
_____ 8. Secretary
_____ 9. Statistical Clerk
_____ 10. Stenographer
_____ 11. Teacher Aide
_____ 12. Telephone Operator
_____ 13. Traffic, Shipping, & Receiving Clerk
_____ 14. Typist
_____ 15. _____

Directions: Listed on the following pages are math skills that may or may not be used in your occupational area. Please rate each skill as to how important or essential the skill is in the performance of your work.

Circle the number on the "Importance Scale" that best indicates your response.

1 = Not Important 2 = Somewhat Important 3 = Very Important

	IMPORTANCE SCALE		
	Not Important	Somewhat Important	Very Important
EXAMPLE: Reading whole numbers aloud.....	1	(2)	3

BASIC MATH SKILLS

		IMPORTANCE SCALE		
		Not Important	Somewhat Important	Very Important
1.	Add and/or subtract whole numbers (e.g., 15 + 3 = 18; 12,568 − 5,763 = 6,805)	1	2	3
2.	Multiply and/or divide whole numbers (e.g., 35 × 9 = 315; 14,658 ÷ 2 = 7,329)	1	2	3
3.	Round off whole numbers to nearest multiple of ten (e.g., 9 to 10; 253 to 250)	1	2	3
4.	Add and/or subtract fractions (e.g., 3/9 + 2/9 = 5/9; 1 1/4 − 1/2 = 3/4)	1	2	3
5.	Multiply and/or divide fractions (e.g., 1/3 × 1/4 = 1/12; 12 ÷ 1/3 = 36; 6/9 ÷ 2/3 = 1)	1	2	3
6.	Reduce fractions to lowest terms (e.g., 2/6 to 1/3; 12/18 to 2/3)	1	2	3
7.	Round mixed numbers to nearest whole number (e.g., 1 1/3 to 1; 5 7/8 to 6)	1	2	3
8.	Convert improper fractions to mixed numbers (e.g., 3/2 to 1 1/2; 106/33 to 3 7/33)	1	2	3
9.	Convert mixed numbers to improper fractions (e.g., 5 6/7 to 41/7; 3 3/8 to 27/8)	1	2	3
10.	Convert fractions to decimals and/or decimals to fractions (e.g., 1/2 to .5; 3/5 to .6; .25 = 1/4; 1.5 = 1 1/2	1	2	3
11.	Convert fractions to percents and/or percents to fractions (e.g., 1/4 = 25%; 3/5 = 60%; 75% to 3/4; 125% to 1 1/4)	1	2	3
12.	Add and/or subtract decimals (e.g., .59 + .608 = 1.198; $7.55 + $1.43 = $8.98; 53.8 − 38.6 = 15.2)	1	2	3
13.	Multiply and/or divide decimals (e.g., 8.65 × .2 = 1.73; 36 ÷ 2.25 = 16.00)	1	2	3
14.	Multiply whole numbers and/or decimals by 10, 100, etc. (e.g., 63 × 10 = 630; 58.3 × 10 = 583; .23 × 100 = 23)	1	2	3
15.	Divide whole numbers and/or decimals by 10, 100, etc. (e.g., 23 ÷ 10 = 2.3; 689 ÷ 100 = 6.89)	1	2	3
16.	Round off decimals to one or more places (e.g., .18 to .2; 6.9835 to 6.98)	1	2	3
17.	Convert decimals to percents and/or percents to decimals (e.g., .1 = 10%; .43 = 43%; .7% = .007; 235% = 2.35)	1	2	3
18.	Find what percent one number is of another	1	2	3
19.	Find a number when a percent is known	1	2	3
20.	Use ratio to compare one value to another (e.g., 5/1 = 5:1 = 5 to 1; 240 to 160 = 3:2)	1	2	3
21.	Average numbers	1	2	3
22.	Square a number	1	2	3
23.	Find the square root of a number	1	2	3
24.	Read a ruler	1	2	3
25.	Interpret line graphs, circle graphs, bar graphs, and/or tables	1	2	3
26.	Compute the area of simple geometric figures (e.g., area of a circle, rectangle, or square)	1	2	3
27.	Compute the area of complex geometric figures (e.g., parallelogram, triangle, or trapezoid)	1	2	3
28.	Compute the volume of simple geometric solids (e.g., volume of rectangular solid, cube, cylinder, or sphere)	1	2	3
29.	Compute the volume of complex geometric solids (e.g., cone or pyramid)	1	2	3
30.	Use equations, or formulas, to solve problems	1	2	3

		IMPORTANCE SCALE		
		Not Important	Somewhat Important	Very Important
31.	Solve problems involving length, width, and/or height	1	2	3
32.	Solve problems involving time	1	2	3
33.	Solve problems involving weight	1	2	3
34.	Solve problems involving distance	1	2	3
35.	Solve problems involving conversion between English units (feet, inches, pounds, miles, etc.) and metric units (meters, centimeters, kilograms, kilometers, etc.)	1	2	3
36.	Mentally estimate the answers to given problems, either word problems or basic calculations	1	2	3

MATH RELATED BUSINESS SKILLS

37.	Compute simple and/or compound interest by hand or calculator	1	2	3
38.	Compute simple and/or compound interest from a table	1	2	3
39.	Compute trade and cash discounts	1	2	3
40.	Compute sales tax	1	2	3
41.	Prepare sales slips and/or invoices	1	2	3
42.	Compute a job cost	1	2	3
43.	Compute cost of goods sold	1	2	3
44.	Compute selling price	1	2	3
45.	Compute net sales	1	2	3
46.	Solve markup problems	1	2	3
47.	Solve markdown problems	1	2	3
48.	Solve finance charge and annual percentage rate problems	1	2	3
49.	Compute depreciation	1	2	3
50.	Complete time cards or sheets for regular and overtime hours	1	2	3
51.	Compute salaries and complete payroll records	1	2	3
52.	Compute commission	1	2	3
53.	Prepare checks/drafts and deposits and complete checkbook register	1	2	3
54.	Reconcile check records and bank statements	1	2	3
55.	Maintain budget records	1	2	3
56.	Prepare balance sheet	1	2	3
57.	Prepare income statement	1	2	3
58.	Maintain petty cash and records	1	2	3
59.	Maintain customer's accounts	1	2	3
60.	Maintain inventory records	1	2	3
61.	Maintain equipment records	1	2	3
62.	Compute postage, mailing, and/or freight charges	1	2	3
63.	Obtain information from travel schedule (e.g., bus or airline schedule)	1	2	3
64.	Use ten-key adding machine or electronic calculator	1	2	3
65.	Use computer terminals for data entry and data output	1	2	3
66.	Use computer for solving math problems	1	2	3

Please list any additional math skills that you believe are needed. Rate the importance of these skills.

1. _____	1	2	3
2. _____	1	2	3
3. _____	1	2	3
4. _____	1	2	3
5. _____	1	2	3

Please indicate highest level of education completed:

_____Grade 1-8	_____Grade 11	_____2 years College
_____Grade 9	_____Grade 12	_____3 years College
_____Grade 10	_____1 year College	_____4 years College
_____Vocatonal/Technical school		
_____Other: _____		

Are you satisfied with your math peformance on the job? _____Yes _____No

Are you satisfied with the math preparation you received in:

a. grammar / elementary school (1-8)	_____Yes	_____No
b. high school (9-12)	_____Yes	_____No
c. area vocational / technical school	_____Yes	_____No
d. college	_____Yes	_____No

PLEASE RETURN QUESTIONNAIRE TO:

Dr. Donna H. Redmann
OA/BE Dept.
Southeastern Louisiana University
P.O. Box 526, SLU
Hammond, LA 70402

FACTSHEET
ON
MAJOR JOB CLUSTERS FOR OFFICE OCCUPATIONS

Occupations:	Nature of Work:	Related Occupations:
1. **BANK TELLER**	processes money, checks, and other financial items for customers	new account teller, cashier, toll collector, post office clerk, auction clerk, ticket seller
2. **BOOKKEEPER & ACCOUNTING CLERK**	keeps systematic and up-to-date records of accounts and business transactions	collection worker, insurance clerk, statistical clerk
3. **COMPUTER & PERIPHERAL EQUIPMENT OPERATOR**	runs computers and peripheral equipment, e.g. printer, disk drive, tape reader	systems analyst, programmer, computer service technician, printing typesetter and compositor
4. **DATA ENTRY KEYER**	obtains data from checks, bills, invoices and other documents, and puts it into the computer system	printing typesetter and compositor
5. **MAIL CARRIER & POSTAL CLERK**	calculates postage due, files and retrieves mail, delivers and picks up mail, sorts and cancels mail, gives information on postal rates, mailing regulations, weights and classes of mail	mail clerk, file clerk, routing clerk, mail sorter
6. **RECEPTIONIST & INFORMATION CLERK**	greets callers, determines their needs and refers them to the proper person or office	customer service representative, dispatcher, hotel clerk, concierge
7. **RESERVATION & TRANSPORTATION TICKET AGENT &TRAVEL CLERK**	assists customers in travel planning, makes and confirms reservations, calculates expenses, writes and sells tickets, checks passenger baggage, gives departure information and assists passengers at departure point	ground host/hostess (air transportation), appointment clerk, concierge
8. **SECRETARY** (Types: administrative, legal, medical, membership, school, social, technical)	processes and transmits information both within and to and from businesses, performs a variety of administrative and clerical duties, e.g. schedules appointments, handles callers, organizes and maintains files, fills out forms, takes and transcribes dictation	office manager, personnel clerk, administrative assistant, legal assistant, medical assistant, medical record technician
9. **STATISTICAL CLERK** (Types: computing, tabulating, recording/compiling/coding)	helps develop and research information, creates and records documents that primarily involve numbers, helps ensure those numbers are complete and accurate	payroll clerk, insurance clerk
10. **STENOGRAPHER** (Types: general, technical, shorthand reporter, transcribing machine operator, print shop)	takes dictation and then transcribes it on a typewriter or word processor; the dictation may be taken by hand or by stenotype machine, which prints shorthand symbols	medical assistant, legal assistant court reporter, freelance reporter,
11. **TEACHER AIDE**	helps to supervise students in the classroom, cafeteria, or schoolyard, records grades, sets up equipment, helps prepare materials for instruction, and performs secretarial duties, e.g. typing, filing, and duplicating	childcare attendant, career guidance technician, home health aide, library attendant, medical record technician, nurse aide, record custodian
12. **TELEPHONE OPERATOR** (Types: telephone company, switchboard, e.g. PBX)	telephone operator assists customers with calls, obtains the information needed to record the charges for billing; switchboard operator runs the switchboard for a business or hotel, connects interoffice or house calls, answers and relays outside calls, assists company employees in making outside calls, supplies information to callers, and records charges	customer service representative, dispatcher, hotel clerk, police aide, taxicab starter
13. **TRAFFIC, SHIPPING, & RECEIVING CLERK**	keeps track of goods transferred between businesses and their customers and suppliers	stock clerk, material clerk, distributing clerk, routing clerk, order filler
14. **TYPIST** (Types: beginning/junior, borderian clerk, clerk, continuity clerk, notereader, senior, word-processing-machine operator)	creates neat, typed documents from handwritten, printed and mechanically recorded words	office machine operator, court reporter, freelance reporter

SOURCE: *Occupational Outlook Handbook*, 1986-87 Edition; "Administrative Support Occupations, Including Clerical", U. S. Dept. of Labor, Bulletin 2250, April 1986, pp. 269-294.

Southeastern Louisiana University
Dept. of Office Administration &
Business Education
504/549-2335

BUSINESS MATH SKILLS QUESTIONNAIRE
Employer/Supervisor Form

Your Name: _____

Name of Firm: _____

Address: _____

Telephone Number: _____

Job Title: _____

Please indicate size of firm, based on the total number of employees:

_____ a. small (1-199), _____ b. medium (200-499), _____ c. large (500 & over).

Purpose: We are trying to learn what business-related math skills are absolutely necessary for success in office occupations. This information will be used to develop a business math curriculum guide to be used by business education teachers in Louisiana's schools.

Job Description: Please select **only one** of the following 14 job clusters that describes the largest number of office workers in your firm or under your supervision. To assist you in identifying the job cluster that best describes your employees' position, a fact sheet on the major types of office jobs is provided. If none of the 14 clusters listed describes your employees' jobs, please check No. 15 and use the space provided to write their job description.

_____ 1. Bank Teller
_____ 2. Bookkeeper & Accounting Clerk
_____ 3. Computer & Peripheral Equipment Operator
_____ 4. Data Entry Keyer
_____ 5. Mail Carrier & Postal Clerk
_____ 6. Receptionist
_____ 7. Reservation & Transportation Ticket Agent & Travel Clerk
_____ 8. Secretary
_____ 9. Statistical Clerk
_____ 10. Stenographer
_____ 11. Teacher Aide
_____ 12. Telephone Operator
_____ 13. Traffic, Shipping, & Receiving Clerk
_____ 14. Typist
_____ 15. _____

Directions: Listed on the following pages are math skills that may or may not be used by your employees in the occupational cluster you chose above. Please rate each skill for the above selected job cluster as to how important or essential the skill is in the performance of your employees' work.

Circle the number on the "Importance Scale" that best indicates your response.

1 = Not Important 2 = Somewhat Important 3 = Very Important

	IMPORTANCE SCALE		
	Not Important	Somewhat Important	Very Important
EXAMPLE: Reading whole numbers aloud.....	1	(2)	3

BASIC MATH SKILLS

		IMPORTANCE SCALE		
		Not Important	Somewhat Important	Very Important
1.	Add and/or subtract whole numbers (e.g., 15 + 3 = 18; 12,568 – 5,763 = 6,805)	1	2	3
2.	Multiply and/or divide whole numbers (e.g., 35 × 9 = 315; 14,658 ÷ 2 = 7,329)	1	2	3
3.	Round off whole numbers to nearest multiple of ten (e.g., 9 to 10; 253 to 250)	1	2	3
4.	Add and/or subtract fractions (e.g., 3/9 + 2/9 = 5/9; 1 1/4 – 1/2 = 3/4)	1	2	3
5.	Multiply and/or divide fractions (e.g., 1/3 × 1/4 = 1/12; 12 ÷ 1/3 = 36; 6/9 ÷ 2/3 = 1)	1	2	3
6.	Reduce fractions to lowest terms (e.g., 2/6 to 1/3; 12/18 to 2/3)	1	2	3
7.	Round mixed numbers to nearest whole number (e.g., 1 1/3 to 1; 5 7/8 to 6)	1	2	3
8.	Convert improper fractions to mixed numbers (e.g., 3/2 to 1 1/2; 106/33 to 3 7/33)	1	2	3
9.	Convert mixed numbers to improper fractions (e.g., 5 6/7 to 41/7; 3 3/8 to 27/8)	1	2	3
10.	Convert fractions to decimals and/or decimals to fractions (e.g., 1/2 to .5; 3/5 to .6; .25 = 1/4; 1.5 = 1 1/2	1	2	3
11.	Convert fractions to percents and/or percents to fractions (e.g., 1/4 = 25%; 3/5 = 60%; 75% to 3/4; 125% to 1 1/4)	1	2	3
12.	Add and/or subtract decimals (e.g., .59 + .608 = 1.198; $7.55 + $1.43 = $8.98; 53.8 – 38.6 = 15.2)	1	2	3
13.	Multiply and/or divide decimals (e.g., 8.65 × .2 = 1.73; 36 ÷ 2.25 = 16.00)	1	2	3
14.	Multiply whole numbers and/or decimals by 10, 100, etc. (e.g., 63 × 10 = 630; 58.3 × 10 = 583; .23 × 100 = 23)	1	2	3
15.	Divide whole numbers and/or decimals by 10, 100, etc. (e.g., 23 ÷ 10 = 2.3; 689 ÷ 100 = 6.89)	1	2	3
16.	Round off decimals to one or more places (e.g., .18 to .2; 6.9835 to 6.98)	1	2	3
17.	Convert decimals to percents and/or percents to decimals (e.g., .1 = 10%; .43 = 43%; .7% = .007; 235% = 2.35)	1	2	3
18.	Find what percent one number is of another	1	2	3
19.	Find a number when a percent is known	1	2	3
20.	Use ratio to compare one value to another (e.g., 5/1 = 5:1 = 5 to 1; 240 to 160 = 3:2)	1	2	3
21.	Average numbers	1	2	3
22.	Square a number	1	2	3
23.	Find the square root of a number	1	2	3
24.	Read a ruler	1	2	3
25.	Interpret line graphs, circle graphs, bar graphs, and/or tables	1	2	3
26.	Compute the area of simple geometric figures (e.g., area of a circle, rectangle, or square)	1	2	3
27.	Compute the area of complex geometric figures (e.g., parallelogram, triangle, or trapezoid)	1	2	3
28.	Compute the volume of simple geometric solids (e.g., volume of rectangular solid, cube, cylinder, or sphere)	1	2	3
29.	Compute the volume of complex geometric solids (e.g., cone or pyramid)	1	2	3
30.	Use equations, or formulas, to solve problems	1	2	3

		IMPORTANCE SCALE		
		Not Important	Somewhat Important	Very Important
31.	Solve problems involving length, width, and/or height	1	2	3
32.	Solve problems involving time	1	2	3
33.	Solve problems involving weight	1	2	3
34.	Solve problems involving distance	1	2	3
35.	Solve problems involving conversion between English units (feet, inches, pounds, miles, etc.) and metric units (meters, centimeters, kilograms, kilometers, etc.)	1	2	3
36.	Mentally estimate the answers to given problems, either word problems or basic calculations	1	2	3

MATH RELATED BUSINESS SKILLS

37.	Compute simple and/or compound interest by hand or calculator	1	2	3
38.	Compute simple and/or compound interest from a table	1	2	3
39.	Compute trade and cash discounts	1	2	3
40.	Compute sales tax	1	2	3
41.	Prepare sales slips and/or invoices	1	2	3
42.	Compute a job cost	1	2	3
43.	Compute cost of goods sold	1	2	3
44.	Compute selling price	1	2	3
45.	Compute net sales	1	2	3
46.	Solve markup problems	1	2	3
47.	Solve markdown problems	1	2	3
48.	Solve finance charge and annual percentage rate problems	1	2	3
49.	Compute depreciation	1	2	3
50.	Complete time cards or sheets for regular and overtime hours	1	2	3
51.	Compute salaries and complete payroll records	1	2	3
52.	Compute commission	1	2	3
53.	Prepare checks/drafts and deposits and complete checkbook register	1	2	3
54.	Reconcile check records and bank statements	1	2	3
55.	Maintain budget records	1	2	3
56.	Prepare balance sheet	1	2	3
57.	Prepare income statement	1	2	3
58.	Maintain petty cash and records	1	2	3
59.	Maintain customer's accounts	1	2	3
60.	Maintain inventory records	1	2	3
61.	Maintain equipment records	1	2	3
62.	Compute postage, mailing, and/or freight charges	1	2	3
63.	Obtain information from travel schedule (e.g., bus or airline schedule)	1	2	3
64.	Use ten-key adding machine or electronic calculator	1	2	3
65.	Use computer terminals for data entry and data output	1	2	3
66.	Use computer for solving math problems	1	2	3

Please list any additional math skills that you believe are needed. Rate the importance of these skills.

1. _____	1	2	3
2. _____	1	2	3
3. _____	1	2	3
4. _____	1	2	3
5. _____	1	2	3

Are you satisfied with the math performance of your office employees? _____Yes _____No

PLEASE RETURN QUESTIONNAIRE TO:

Dr. Donna H. Redmann
OA/BE Dept.
Southeastern Louisiana University
P.O. Box 526, SLU
Hammond, LA 70402

Appendix C

Comparison of the Employees' Responses by Job Category

About the Importance of Math Skills Performed in Office Occupations

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
1.	Add/subtract whole numbers	R=1st M=2.7444	R=2nd M=2.971 (3,4,6, 8,10, 11,13, 14)	R=3rd M=2.8863 (3,4,6, 8,10, 11,13, 14)	R=12th M=2.500 (1,2,7, 9,12)	R=9th M=2.5484 (1,2,7, 9,12)	R=6th M=2.7429	R=11th M=2.5172 (1,2,7, 9,12)	R=1st M=2.9444 (3,4,6, 8,10, 13,14)	R=7th M=2.6346 (1,2,7, 9,12)	R=5th M=2.8267 (3,4,6, 8,10, 13,14)	R=10th M=2.5455 (1,2,7, 9)	R=8th M=2.6250 (1,2)	R=4th M=2.8409 (3,4,6, 8,13, 14)	R=12th M=2.500 (1,2,7, 9,12)	R=14th M=2.4783 (1,2,7, 9,12)	5.8885***
2.	Muliply/divide whole numbers	R=3rd M=2.5739	R=8th M=2.4896 (2,7)	R=2nd M=2.7524 (1,3,4, 6,8)	R=14th M=2.2500 (2,5,7, 9,12)	R=13th M=2.2698 (2,5,7, 8,9,12)	R=5th M=2.6571 (3,4)	R=12th M=2.3103 (2,7,9, 12)	R=1st M=2.8889 (1,3,4, 6,8)	R=7th M=2.5192 (2,7)	R=4th M=2.7027 (3,4,6)	R=10th M=2.4545	R=6th M=2.5250	R=3rd M=2.7045 (3,4,6)	R=11th M=2.3889	R=9th M=2.4783	4.3552***
3.	Round off whole numbers	R=7th M=2.0402	R=7th M=1.9462 (2,6)	R=1st M=2.2952 (1,4,5, 6,8,10, 12)	R=8th M=1.9130	R=11th M=1.8730 (2)	R=10th M=1.8824 (2)	R=14th M=1.5000 (1,2,7, 8,9,11)	R=2nd M=2.2778 (6,10)	R=5th M=2.0192 (2,6)	R=4th M=2.0167 (6,10)	R=13th M=1.6364 (2,7,9 11)	R=3rd M=2.1500 (6,10)	R=12th M=1.8333 (2)	R=9th M=1.8889	R=6th M=2.000	4.1230***
4.	Add/subtract fractions	R=31st M=1.5891	R=9th M=1.5269	R=3rd M=1.6875 (10)	R=8th M=1.5417	R=11th M=1.4762	R=5th M=1.5882	R=12th M=1.4483	R=2nd M=1.7778	R=4th M=1.6218	R=7th M=1.5733	R=14th M=1.2727 (2)	R=6th M=1.5750	R=10th M=1.5000	R=13th M=1.4444	R=1st M=1.7826	1.2260
5.	Multiply/divide fractions	R=40th M=1.5130	R=9th M=1.4255 (2,14)	R=4th M=1.6429 (1,4,6, 10,11)	R=6th M=1.5000	R=11th M=1.3492 (2,14)	R=2nd M=1.6857 (10,11)	R=13th M=1.2759 (2,14)	R=3rd M=1.6471	R=5th M=1.5641 (10)	R=7th M=1.4730	R=14th M=1.364 (2,5,8, 14)	R=12th M=1.3000 (2,5,14)	R=10th M=1.4186	R=8th M=1.4444	R=1st M=1.8261 (1,4,6, 10,11)	2.7682***
6.	Reduce fractions to lowest terms	R=47th M=1.3765	R=11th M=1.2553	R=5th M=1.4502 (1,10)	R=3rd M=1.5000 (3)	R=9th M=1.2857	R=4th M=1.4571 (10)	R=13th M=1.1724	R=2nd M=1.5556 (10)	R=6th M=1.4167 (10)	R=8th M=1.3919 (10)	R=14th M=1.0455	R=12th M=1.2308	R=7th M=1.4091	R=10th M=1.2778	R=1st M=1.5652 (10)	1.9826*

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
7.	Round mixed numbers	R=30th M=1.6141	R=11th M=1.4787	R=2nd M=1.8381 (1,4,5, 6,8,9, 10,13)	R=3rd M=1.7083 (6)	R=10th M=1.4921	R=9th M=1.5143	R=14th M=1.2069	R=1st M=1.8889 (6,10)	R=6th M=1.6026 (6)	R=5th M=1.6081 (6)	R=13th M=1.2727	R=7th M=1.5750	R=8th M=1.5227	R=12th M=1.3333	R=4th M=1.6957 (6)	3.4962***
8.	Convert improper fractions to mixed numbers	R=56th M=1.2706	R=10th M=1.1809	R=2nd M=1.3365	R=8th M=1.2500	R=7th M=1.2540	R=4th M=1.3143	R=14th M=1.0345 (2,9,14)	R=5th M=1.2778	R=6th M=1.2581	R=3rd M=1.3243 (6)	R=12th M=1.1364	R=11th M=1.1/50	R=8th M=1.2500	R=13th M=1.1111	R=1st M=1.6957 (all)	2.3126**
9.	Convert mixed numbers to improper fractions	R=59th M=1.2494	R=10th M=1.1702 (14)	R=5th M=1.3095 (6,14)	R=3rd M=1.3750	R=9th M=1.2222 (14)	R=4th M=1.3143	R=12th M=1.0690 (2,14)	R=2nd M=1.4118	R=7th M=1.2273 (14)	R=6th M=1.2838 (14)	R=14th M=1.0455 (14)	R=11th M=1.1250 (14)	R=7th M=1.2273 (14)	R=13th M=1.0588 (14)	R=1st M=1.6087 (1,2,4, 6,8,9, 10,11, 12,13)	2.4651**
10.	Convert fractions to decimals/vice versa	R=31st M=1.5891	R=10th M=1.4574 (2,8)	R=4th M=1.6905 (1,6,10, 11)	R=7th M=1.5000	R=8th M=1.4921	R=5th M=1.6286	R=13th M=1.3103 (2,8,4)	R=2nd M=1.7647	R=3rd M=1.7179 (1,6,10, 11)	R=6th M=1.6216	R=14th M=1.2727 (2,8,14)	R=12th M=1.3500 (2,8,14)	R=9th M=1.4773	R=11th M=1.4118	R=1st M=1.8182 (6,10,11)	2.3595**
11.	Convert fractions to percents/vice versa	R=25th M=1.6832	R=10th M=1.5532 (2,8)	R=4th M=1.7952 (1,6,11)	R=5th M=1.6667	R=9th M=1.5806	R=8th M=1.6000	R=13th M=1.4138 (2,7,8)	R=1st M=2.0000 (6,10,11)	R=3rd M=1.8366 (1,6,10, 11)	R=7th M=1.6081	R=14th M=1.4091 (2,7,8)	R=12th M=1.4250 (2,7,8)	R=6th M=1.6364	R=11th M=1.5000	R=2nd M=1.8696	2.5153**
12.	Add/subtract decimals	R=5th M=2.1747	R=3rd M=2.2766 (10,13)	R=2nd M=2.3269 (4,10, 12,13)	R=9th M=2.0000	R=10th M=1.9841 (2)	R=4th M=2.2571 (10)	R=8th M=2.1034	R=1st M=2.5000 (10,13)	R=6th M=2.1923 (10,13)	R=7th M=2.1600 (10)	R=14th M=1.6364 (1,2,5, 8,9,11)	R=5th M=2.2250 (10)	R=12th M=1.9545 (2)	R=13th M=1.7222 (1,2,7, 8)	R=11th M=1.9565 (2)	2.8072***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
13.	Multiply/divide decimals	R=8th M=2.0306	R=8th M=1.9362	R=2nd M=2.1991 (3,4,8, 10)	R=12th M=1.7083 (2)	R=11th M=1.8254 (2)	R=5th M=2.0571	R=10th M=1.8276	R=1st M=2.2941 (10)	R=4th M=2.1026 (2,10)	R=7th M=2.0000	R=14th M=1.5455 (2,7,8, 11)	R=3rd M=2.1500 (10)	R=6th M=2.0455	R=13th M=1.7059	R=9th M=1.8696	2.5084
14.	Multiply by 10, 100, etc.	R=9th M=2.0083	R=5th M=2.0213 (10)	R=2nd M=2.2010 (4,6,8, 10,12)	R=9th M=1.9167	R=12th M=1.7778 (2,5)	R=1st M=2.2571 (4,6,10)	R=13th M=1.6897 (2,5)	R=3rd M=2.1176	R=7th M=1.9677 (2)	R=8th M=1.9595	R=14th M=1.5455 (1,2,5, 11)	R=4th M=2.0750 (10)	R=11th M=1.8636 (2)	R=10th M=1.8824	R=6th M=2.0000	2.6564**
15.	Divide by 10, 100, etc.	R=11th M=1.8962	R=11th M=1.8085 (2,10)	R=1st M=2.0909 (1,4,6, 8,10)	R=7th M=1.8750	R=12th M=1.6984 (2)	R=3rd M=2.0000 (10)	R=13th M=1.5862 (2)	R=5th M=1.9444	R=6th M=1.8846 (2,10)	R=9th M=1.8378 (10)	R=14th M=1.3636 (1,2,5, 8,9,11, 14)	R=4th M=1.9500 (10)	R=8th M=1.8409	R=10th M=1.8235	R=2nd M=2.0870 (10)	2.4918**
16.	Round off decimals to one or more places	R=10th M=1.9342	R=9th M=1.7234 (2,8,9, 11)	R=2nd M=2.1517 (1,3,4, 5,6,10, 12,13)	R=11th M=1.6250 (2,11)	R=7th M=1.8413 (2,11)	R=8th M=1.7941 (2,11)	R=13th M=1.4828 (2,7,8, 9,11)	R=3rd M=2.0556 (6,10)	R=5th M=2.0064 (1,6,10, 12)	R=4th M=2.0533 (1,6,10, 12)	R=14th M=1.4091 (2,7,8, 9,11)	R=1st M=2.2750 (1,3,4, 5,6,10, 12,13)	R=10th M=1.6364 (2,8,9, 11)	R=2nd M=1.6111 (2,11)	R=6th M=1.9130	4.9413***
17.	Convert decimals to percents/visa versa	R=19th M=1.7583	R=9th M=1.6522	R=4th M=1.8373 (10)	R=7th M=1.7500	R=8th M=1.6825	R=11th M=1.6000	R=13th M=1.4828 (8)	R=1st M=1.9412 (10)	R=2nd M=1.9032 (6,10,11)	R=5th M=1.7973 (10)	R=14th M=1.3182 (2,7,8, 9)	R=6th 1.7692 (8)	R=12th M=1.5909	R=10th M=1.611	R=3rd M=1.8696	1.9117*
18.	Find what percent one number is of another	R=12th M=1.8771	R=12th M=1.6304 (2,7,8, 9)	R=2nd M=2.0237 (1,6,10, 11)	R=5th M=1.8750	R=6th M=1.8730 (10)	R=8th M=1.7941	R=13th M=1.5714 (2,7,8, 9)	R=1st M=2.2778 (1,6,10, 11)	R=4th M=1.9613 (1,6,10)	R=3rd M=2.0133 (1,6,10)	R=14th M=1.4091 (2,4,7, 8,9)	R=10th M=1.6667 (2,7)	R=9th M=1.7727	R=10th M=1.6667	R=7th M=1.8696	3.1561***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
19.	Find a number when a percent is known	R=21st M=1.7248	R=11th M=1.5109 (2,7,8, 9)	R=3rd M=1.8502 (1,10)	R=8th M=1.6667	R=5th M=1.7778	R=7th M=1.7143	R=13th M=1.4828 (7)	R=1st M=2.0556 (1,6,10)	R=6th M=1.7628 (1)	R=2nd M=1.8649 (1,10)	R=14th M=1.3636 (2,7,8, 9)	R=9th M=1.5897	R=10th M=1.5581	R=12th M=1.5000	R=4th M=1.7826	2.3310**
20.	Use Ratios	R=51st M=1.3318	R=13th M=1.1809 (2,7,14)	R=5th M=1.3667 (1,14)	R=3rd M=1.5000	R=8th M=1.3175 (14)	R=4th M=1.4571	R=14th M=1.1379 (2,7,14)	R=2nd M=1.5882 (1,6)	R=6th M=1.3397 (14)	R=9th M=1.3108 (14)	R=12th M=1.2273 (14)	R=10th M=1.2564 (14)	R=7th M=1.3182 (14)	R=11th M=1.2353 (14)	R=1st M=1.6957 (1,2,4, 4,5,6, 8,9,10, 11,12, 13)	2.0275*
21.	Average numbers	R=15th M=1.7857	R=12th M=1.6170 (2,7,8)	R=3rd M=1.8786 (1,6,7, 10)	R=7th M=1.7917 (7)	R=9th M=1.6667 (7)	R=10th M=1.6765 (7)	R=13th M=1.4828 (2,7,8)	R=1st M=2.3889 (1,2,3, 4,5,6, 8,9,10, 11,12,14)	R=5th M=1.8701 (1,6,7, 10)	R=6th M=1.8082 (7)	R=14th M=1.4286 (2,7,8)	R=4th M=1.8718 (7)	R=11th M=1.6364 (7)	R=2nd M=1.8889	R=8th M=1.7826 (7)	2.1680**
22.	Square a number	R=61st M=1.1661	R=11th M=1.1064 (7,14)	R=8th M=1.1553 (7,14)	R=6th M=1.2083 (14)	R=5th M=1.2222 (11,14)	R=3rd M=1.2857 (11,14)	R=13th M=1.0345 (5,7,14)	R=2nd M=1.4706 (11)	R=10th M=1.1234 (7,14)	R=9th M=1.1486 (7,14)	R=12th M=1.0909 (7,14)	R=14th M=1.0000 (4,5,7, 12,14)	R=4th M=1.2273 (11,14)	R=7th M=1.1667 (14)	R=1st M=1.6522 (11)	4.4291***
23.	Find square root	R=63rd M=1.1407	R=11th M=1.0745 (5,7,14)	R=9th M=1.1048 (7,14)	R=4th M=1.2500 (14)	R=6th M=1.1803 (7,14)	R=3rd M=1.2647 (1,7,11, 14)	R=12th M=1.0714 (7,14)	R=2nd M=1.5000 (1,2,4, 5,6,8, 9,10,11, 12,13)	R=10th M=1.0897 (7,14)	R=7th M=1.1622 (7,14)	R=13th M=1.0455 (7,14)	R=14th M=1.0250 (5,7,14)	R=5th M=1.2045 (7,14)	R=8th M=1.1111 (7,14)	R=1st M=1.6087 (1,2,3, 4,5,6, 8,9,10, 11,12,13)	4.9264***
24.	Read a ruler	R=20th M=1.7258	R=13th M=1.3617 (3,5,7, 8,9,10, 12,14)	R=11th M=1.5498 (3,5,7, 8,9, 10,12, 14)	R=2nd M=2.1667 (1,2,4, 6,11)	R=10th M=1.6129 (3,5,8, 12,14)	R=1st M=2.2286 (1,2,4, 6,9,11)	R=14th M=1.3214 (3,5,7, 8,9,10, 12,14)	R=5th M=2.000 (1,2,6, 11)	R=7th M=1.9419 (1,2,4, 6,11)	R=9th M=1.7703 (1,2,5, 6,11, 12)	R=6th M=2.9545 (1,2,6, 11)	R=12th M=1.4359 (3,5,7, 8,9, 10,12 14)	R=3rd M=2.1163 (1,2,4, 6,9,11)	R=8th M=1.7778	R=4th M=2.0870 (1,2,4, 6,11)	8.0584***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
25.	Interpret graphs and tables	R=46th M=1.4104	R=12th M=1.1915 (2,3,5, 7,8,9, 14)	R=8th M=1.3762 (1,3,8, 14)	R=1st M=1.7917 (1,2,4, 6,9,10, 11)	R=11th M=1.3175 (3,8,14)	R=5th M=1.5429 (1)	R=14th M=1.1724 (3,8,14)	R=3rd M=1.5882 (1)	R=4th M=1.5641 (1,2,4, 6,10)	R=6th M=4189 (1,3,14)	R=13th M=1.1818 (3,8,14)	R=9th M=1.3590 (3,14)	R=7th M=1.3864 (3,14)	R=10th M=1.3333	R=2nd M=1.7826 (1,2,4, 6,9, 10,11)	3.7507***
26.	Compute area of simple geometric figures	R=62nd M=1.1633	R=12th M=1.0532 (5,7,14)	R=9th M=1.1232 (5,7,14)	R=4th M=1.2500 (14)	R=8th M=1.1429 (5,14)	R=3rd M=1.3714 (1,2,4, 6,8,10, 11,14)	R=14th M=1.0000 (5,7,14)	R=2nd M=1.3889 (1,2,6, 10,11,14)	R=7th M=1.1795 (1,5,14)	R=5th M=1.1892 (14)	R=13th M=1.0455 (5,7,14)	R=11th M=1.0750 (5,7,14)	R=6th M=1.1818 (14)	R=10th M=1.1111 (14)	R=1st M=1.7391 (all)	5.4495***
27.	Compute area of complex geometric figures	R=64th M=1.1022	R=11th M=1.0532 (14)	R=9th M=1.0758 (14)	R=4th M=1.1667 (14)	R=6th M=1.1587 (14)	R=3rd M=1.1714 (14)	R=12th M=1.0000 (14)	R=2nd M=1.2222 (14)	R=8th M=1.0769 (14)	R=5th M=1.1622 (11,14)	R=12th M=1.0000 (14)	R=12th M=1.0000 (9,14)	R=7th M=1.0909 (14)	R=10th M=1.055 (14)	R=1st M=1.5652 (all)	4.6339***
28.	Compute volume of simple geometric solids	R=65th M=1.1011	R=11th M=1.0532 (5,14)	R=8th M=1.0711 (5,14)	R=4th M=1.667 (14)	R=5th M=1.1587 (14)	R=2nd M=1.2571 (14)	R=12th M=1.0000 (5,14)	R=3rd M=1.2222 (14)	R=9th M=1.0641 (5,14)	R=6th M=1.1351 (14)	R=12th M=1.0000 (5,14)	R=12th M=1.0000 (5,14)	R=7th M=1.1136 (14)	R=10th M=1.0556 (14)	R=1st M=1.5652 (all)	5.0277***
29.	Compute volume of complex geometric solids	R=66th M=1.0873	R=11th M=1.0426 (5,14)	R=8th M=1.0625 (5,14)	R=5th M=1.1250 (14)	R=7th M=1.1111 (14)	R=2nd M=1.2286 (14)	R=12th M=1.0000 (5,14)	R=3rd M=1.1667 (14)	R=10th M=1.0513 (5,14)	R=4th M=1.1351 (14)	R=12th M=1.0000 (5,14)	R=12th M=1.0000 (5,14)	R=6th M=1.1136 (14)	R=9th M=1.0556 (14)	R=1st M=1.5217 (all)	4.9120***
30.	Use equations or formulas	R=44th M=1.4677	R=10th M=1.3511 (2,14)	R=4th M=1.5857 (1,8,10)	R=9th M=1.3750 (14)	R=8th M=1.3968 (14)	R=5th M=1.5429	R=12th M=1.3103 (14)	R=2nd M=1.7222 (10)	R=7th M=1.3974 (2,14)	R=6th M=1.5067	R=14th M=1.1364 (2,7,11, 14)	R=3rd M=1.6250 (10,14)	R=11th M=1.3409 (14)	R=13th M=1.2222	R=1st M=1.8696 (1,3,4, 6,8,10, 11)	2.5257**

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
31.	Solve problems of length, width and/or height	R=49th M=1.3698	R=14th M=1.1277 (3,5,7, 8,10,12, 14)	R=11th M=1.2133	R=6th M=1.5417 (1,2,5, 11,12, 14)	R=8th M=1.3492 (5,7,12, 14)	R=1st M=2.1429 (1,2,3, 4,6,8, 9,10, 11,13)	R=13th M=1.1724 (5,7,12, 14)	R=3rd M=1.9444 (1,2,4, 6,8,9, 11,13)	R=7th M=1.3571 (1,2,5, 7,12,14)	R=9th M=1.2838 (5,7,12, 14)	R=5th M=1.5465 (1,2,5, 11,12, 14)	R=12th M=1.1/50 (3,5,7, 10,12, 14)	R=4th M=1.8636 (1,2,3, 4,6,8, 9,10,11, 13)	R=10th M=1.2778 (5,7,12, 14)	R=2nd M=1.9565 (1,2,3, 4,6,8, 9,10,11, 13)	12.6792***
32.	Solve problems involving time	R=27th M=1.6514	R=12th M=1.5208 (7)	R=11th M=1.5592 (7)	R=8th M=1.6667 (7)	R=14th M=1.4762 (7)	R=2nd M=2.0000 (1,2,4, 6,7)	R=13th M=1.4828 (7)	R=1st M=2.5556 (all)	R=6th M=1.6923 (7)	R=9th M=1.6486 (7)	R=10th M=1.6364 (7)	R=3rd M=1.8462 (7)	R=7th M=1.6818 (7)	R=5th M=1.7222 (7)	R=4th M=1.7826 (7)	3.4809***
33.	Solve problems involving weight	R=53rd M=1.3011	R=12th M=1.0957 (5,7,12, 14)	R=8th M=1.2238 (5,7,12, 14)	R=11th M=1.1250 (5,7,12, 14)	R=7th M=1.2381 (5,7,12, 14)	R=1st M=2.1176 (1,2,4, 6,8,9, 10,11, 13,14)	R=14th M=1.0690 (5,7,12, 14)	R=2nd M=2.1111 (1,2,3, 4,6,8, 9,10,11, 13,14)	R=10th M=1.1923 (5,7,12, 14)	R=6th M=1.3151 (1,5,7, 11,12)	R=5th M=1.3636 (5,7,12)	R=13th M=1.0750 (5,7,12, 14)	R=3rd M=1.9302 (1,2,3, 4,6,8, 9,10,11, 13,14)	R=9th M=1.2222 (5,7,12)	R=4th M=1.5652 (1,2,3, 4,5,6, 7,8,11, 12)	18.0064***
34.	Solve problems involving distance	R=52nd M=1.3044	R=13th M=1.1170 (5,7,12, 14)	R=9th M=1.2201 (5,7,12, 14)	R=12th M=1.1304 (5,7,12, 14)	R=10th M=1.1905 (5,7,12, 14)	R=2nd M=1.8571 (1,2,3, 4,6,7, 8,9,10, 11,12, 13)	R=11th M=1.1786 (5,7,12, 14)	R=1st M=2.3889 (all)	R=7th M=1.2922 (1,5,7, 12,14)	R=6th M=1.3243 (1,5,7, 14)	R=5th M=1.3333 (5,7,14)	R=14th M=1.1026 (5,7,12, 14)	R=4th M=1.5476 (1,2,3, 4,5,6, 7,8,11)	R=8th M=1.2778 (5,7,14)	R=3rd M=1.6957 (1,2,3, 4,6,7, 8,9,10, 11,13)	11.3334***
35.	Converting English Units to Metric Units/vise versa	R=60th M=1.2254	R=14th M=1.0638 (7)	R=7th M=1.1932 (7)	R=5th M=1.3043 (7)	R=6th M=1.2419 (7)	R=2nd M=1.5143 (1,2,4, 6,7,8, 9,10,11, 13)	R=13th M=1.0690 (7)	R=1st M=2.1176 (all)	R=9th M=1.1753 (7)	R=8th M=1.1806 (7)	R=12th M=1.1364 (7)	R=10th M=1.1/50 (7)	R=3rd M=1.5000 (1,2,4, 6,7,8, 9,10,11, 13)	R=11th M=1.1667 (7)	R=4th M=1.3913 (1,7)	7.4137***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
36.	Mental estimation	R=14th M=1.8448	R=10th M=1.7935 (7)	R=4th M=1.9220 (7,13)	R=6th M=1.8333 (7)	R=12th M=1.7541 (7)	R=2nd M=2.0294 (13)	R=7th M=1.8148 (7)	R=1st M=2.4444 (1,2,3, 4,6,8, 9,10,11, 13,14)	R=11th M=1.7584 (7)	R=8th M=1.8082 (7)	R=13th M=1.5909 (7)	R=9th M=1.7949 (7)	R=3rd M=2.0250 (13)	R=14th M=1.4444 (7)	R=5th M=1.9130 (7)	2.2110**
37.	Compute simple/ compound interest	R=23rd M=1.7118	R=1st M=2.0745 (3,4,5, 6,8,9, 10,12, 13)	R=4th M=1.8294 (3,4,5, 6,8,9, 10,12 13)	R=12th M=1.4167 (1)	R=8th M=1.6190 (1)	R=13th M=1.3429 (1,2,7, 11)	R=9th M=1.5517 (1)	R=2nd M=1.9444 (5)	R=7th M=1.6218 (1)	R=6th M=1.6400 (1)	R=14th M=1.3333 (1,2)	R=5th M=1.8000 (5)	R=10th M=1.5349 (1)	R=11th M=1.4444 (1)	R=3rd M=1.8696	3.5999***
38.	Compute simple/ compound interest from table	R=42nd M=1.4704	R=1st M=1.8172 (3,4,5, 6,8,9, 10,11, 12,13)	R=3rd M=1.6381 (3,4,5, 6,8,9)	R=13th M=1.1667 (1,2,14)	R=6th M=1.3968 (1,2,)	R=8th M=1.2857 (1,2)	R=11th M=1.1852 (1,2,14)	R=4th M=1.5556	R=5th M=1.4231 (1,2)	R=7th M=1.3514 (1,2)	R=12th M=1.1818 (1,2,14)	R=10th M=1.2105 (1,2,14)	R=9th M=1.2326 (1,2,14)	R=13th M=1.1667 (1,2)	R=2nd M=1.6957 (3,6,10, 11,12)	5.0810***
39.	Compute trade and cash discount	R=34th M=1.5641	R=8th M=1.5109 (7)	R=3rd M=1.6971 (7,8)	R=12th M=1.4167 (7)	R=5th M=1.6190 (7)	R=10th M=1.4286 (7)	R=6th M=1.5862 (7)	R=1st M=2.2222 (1,2,3, 4,5,6, 8,9,10, 11,12,13)	R=13th M=1.3846 (7)	R=4th M=1.6216 (7)	R=14th M=1.3182	R=11th M=1.4211 (7)	R=7th M=1.5714 (7)	R=9th M=1.4444 (7)	R=2nd M=1.8261 (8)	3.0334***
40.	Compute sales tax	R=16th M=1.7647	R=10th M=1.4839 (2,7,9, 11,14)	R=4th M=1.9952 (1,3,4, 5,7,8, 10,12)	R=11th M=1.4583 (2,7,11)	R=6th M=1.7143 (2,7,11)	R=14th M=1.3143 (2,7,8, 9,11,14)	R=7th M=1.6897 (7,11)	R=1st M=2.6667 (all)	R=8th M=1.6795 (2,5,7, 11)	R=5th M=1.8667 (1,5,7, 12)	R=12th M=1.4091 (2,7,11, 14)	R=2nd M=2.2000 (1,3,4, 5,6,7, 8,10,12, 13)	R=13th M=1.3864	R=9th M=1.6111 (7,11)	R=3rd M=2.0000 (1,5,7, 10,12)	7.1192***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
41.	Prepare sales slips and/or invoices	R=22nd M=1.7231	R=12th M=1.5745 (2,7,14)	R=4th M=1.8510 (1,3,7, 8)	R=14th M=1.3750 (2,7,14)	R=8th M=1.6984 (7)	R=9th M=1.6571 (7)	R=7th M=1.7037 (7)	R=1st M=2.4444 (1,2,3, 4,5,6, 7,8,9, 10,11,12)	R=11th M=1.6090 (2,7,14)	R=5th M=1.7297 (7)	R=10th M=1.6364 (7)	R=13th M=1.5641 (7)	R=6th M=1.7273 (7)	R=3rd M=1.9444	R=2nd M=2.0870 (1,3,8)	2.6523**
42.	Compute a job cost	R=43rd M=1.4694	R=14th M=1.2447 (2,7,9, 14)	R=5th M=1.5476 (1,14)	R=3rd M=1.6250	R=9th M=1.3810 (7,14)	R=7th M=1.4286 (14)	R=10th M=1.3793 (14)	R=2nd M=1.8889 (1,4,8, 10,11,12)	R=6th M=1.4615 (14)	R=4th M=1.5946 (1)	R=13th M=1.3182 (7,14)	R=12th M=1.3250 (7,14)	R=8th M=1.3864 (7,14)	R=11th M=1.3333 (14)	R=1st M=1.9130 (1,2,4, 5,6,8, 10,11, 12,13)	2.5636
43.	Compute cost of goods sold	R=36th M=1.5376	R=14th M=1.2340 (2,4,5, 7,9,11, 12,14)	R=5th M=1.6588 (1,6,7, 8)	R=9th M=1.4167 (7)	R=8th M=1.5238 (1,7)	R=3rd M=1.7429 (1,6,7, 8)	R=13th M=1.2759 (2,5,7, 11,14)	R=1st M=2.3889 (all)	R=11th M=1.3806 (2,5,7, 11,14)	R=6th M=1.6216 (1,7,)	R=12th M=1.3636 (7)	R=4th M=1.7250 (1,6,7, 8)	R=7th M=1.5682 (1,7)	R=10th M=1.3889 (7)	R=2nd M=1.8696 (1,6,7, 8)	4.8766***
44.	Compute selling price	R=39th M=1.5224	R=12th M=1.3043 (2,5,7, 11,14)	R=5th M=1.6714 (1,3,6, 7,8)	R=13th M=1.2917 (2,7,11, 14)	R=6th M=1.5714 (7,8)	R=4th M=1.7429 (1,6,7, 8)	R=14th M=1.2414 (2,5,7, 11,14)	R=1st M=2.7778 (all)	R=11th M=1.3077 (2,4,5, 7,11,14)	R=7th M=1.4730 (7)	R=10th M=1.3182 (7)	R=3rd M=1.7500 (1,3,6, 7,8)	R=8th M=1.4545 (7)	R=9th M=1.3889 (7)	R=2nd M=1.8261 (1,3,6, 7,8)	7.5929***
45.	Compute net sales	R=41st M=1.4770	R=10th M=1.2903 (2,5,7, 14)	R=4th M=1.6699 (1,3,6, 7,8,10, 13)	R=13th M=1.1667 (2,5,7, 14)	R=7th M=1.4921 (7)	R=3rd M=1.6857 (1,3,6, 7,8)	R=14th M=1.1379 (2,5,7, 9,11,14)	R=1st M=2.1667 (1,3,6, 8,10,13)	R=9th M=1.3013 (2,5,7, 14)	R=6th M=1.5333 (6,7,8)	R=11th M=1.2273 (2,7)	R=5th M=1.5750 (6,7)	R=8th M=1.4091 (7)	R=12th M=1.2222 (2,7)	R=2nd M=1.7391 (1,3,6, 8)	5.1078***
46.	Solve mark-up	R=54th M=1.2940	R=14th M=1.1170 (2,4,5, 7,9,14)	R=6th M=1.3714 (1,7,8)	R=7th M=1.2500 (7,14)	R=3rd M=1.4921 (1,8,10)	R=4th M=1.4118 (1,8)	R=10th M=1.1852 (7,14)	R=1st M=1.7222 (1,2,3, 6,8,10, 11,12,13)	R=12th M=1.1410 (2,4,5, 7,9,14)	R=5th M=1.3784 (1,8)	R=13th M=1.1364 (4,7,14)	R=7th M=1.2500 (7,14)	R=9th M=1.2273 (7,14)	R=11th M=1.1667 (7,14)	R=2nd M=1.6522 (1,3,6, 8,10,11, 12,13)	3.9800***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
47.	Solve markdown	R=55th M=1.2949	R=14th M=1.1183 (7)	R=5th M=1.3732 (1,8)	R=9th M=1.2174 (7)	R=3rd M=1.4921 (1,8,10, 12)	R=6th M=1.3143	R=7th M=1.2857	R=1st M=1.6667 (1,3,8, 10,11,12, 13)	R=12th M=1.1494 (7)	R=4th M=1.3973 (1,8)	R=13th M=1.1364 (7)	R=8thg M=1.2500 (7)	R=10th M=1.2093 (7)	R=11th M=1.1765 (7)	R=2nd M=1.6522 (1,3,8, 10,11,12, 13)	3.6288***
48.	Solve finance charge and annual percentage rate	R=45th M=1.4587	R=5th M=1.5745 (8,12)	R=3rd M=1.6058 (5,8,10, 12)	R=11th M=1.2917	R=8th M=1.3968	R=12th M=1.2857 (2)	R=6th M=1.5172	R=1st M=1.7222 (12)	R=10th M=1.3333 (1,2)	R=9th M=1.3919	R=13th M=1.1818 (2)	R=4th M=1.5750 (12)	R=13th M=1.1818 (1,2,7, 11)	R=7th M=1.5000	R=2nd M=1.6087	2.5626**
49.	Compute depreciation	R=58th M=1.2581	R=9th M=1.2151 (14)	R=2nd M=1.3641 (8,11,12, 14)	R=5th M=1.2500 (14)	R=6th M=1.2419 (14)	R=10th M=1.2000 (14)	R=7th M=1.2414 (14)	R=3rd M=1.2778 (14)	R=8th M=1.2208 (2,14)	R=4th M=1.2740 (14)	R=11th M=1.1905 (14)	R=14th M=1.0513 (2,14)	R=13th M=1.0952 (2,14)	R=12th M=1.1111 (14)	R=1st M=1.6522 (all)	2.2887**
50.	Complete time cards for regular & overtime hours	R=6th M=2.0682	R=5th M=2.1667 (6,12)	R=9th M=1.9810 (6,13)	R=8th M=2.0000	R=6th M=2.1129 (6)	R=10th M=1.9143	R=14th M=1.5357 (1,2,4, 8,9,10, 11,13)	R=13th M=1.6667 (8,10,11, 13)	R=4th M=2.2628 (2,6,7, 12,14)	R=7th M=2.0800 (6)	R=2nd M=2.4091 (6,7,12, 14)	R=3rd M=2.3500 (2,6,7, 12,14)	R=12th M=1.7273 (1,2,6, 7,12,14)	R=1st M=2.5000 (2,6,7, 12,14)	R=11th M=1.7391 (2,6,7, 12,14)	3.7923***
51.	Compute salaries/ complete payroll records	R=35th M=1.5586	R=12th M=1.4086 (8)	R=5th M=1.6048	R=10th M=1.4167	R=8th M=1.4355 (8)	R=7th M=1.5714	R=14th M=1.3214 (8)	R=4th M=1.6111	R=1st M=1.7548 (1,4,6, 11,12)	R=6th M=1.5946	R=11th M=1.4091	R=9th M=1.4250 (8)	R=13th M=1.3953 (8)	R=3rd M=1.6111	R=2nd M=1.6522	1.7069
52.	Compute commission	R=57th M=1.2666	R=11th M=1.1505 (7,14)	R=5th M=1.3077 (7,14)	R=4th M=1.3333	R=3rd M=1.3770 (7)	R=6th M=1.2571 (7,14)	R=10th M=1.1724 (7,14)	R=1st M=1.7222 (1,2,4, 5,6,8, 9,10,11, 12,13)	R=8th M=1.2372 (7,14)	R=7th M=1.2568 (7,14)	R=13th M=1.1364 (7,14)	R=9th M=1.1750 (7,14)	R=12th M=1.1395 (7,14)	R=14th M=1.1111 (7,14)	R=2nd M=1.6522 (1,2,5, 6,8,9, 9,10,11, 11,12,13)	2.5293**

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
53.	Prepare checks, deposit, check register	R=18th M=1.7612	R=1st M=2.6237 (all)	R=3rd M=1.8230 (1,3,11, 12)	R=13th M=1.3333 (1,2,7)	R=7th M=1.6032 (1,11)	R=10th M=1.5143 (1)	R=8th M=1.5517 (1)	R=2nd M=2.0000 (1,3,11)	R=5th M=1.6923 (1,11)	R=6th M=1.6757 (1,11)	R=11th M=1.5000 (1)	R=14th M=1.1/95 (1,2,4, 7,8,9, 13)	R=12th M=1.4773 (1,2)	R=4th M=1.7772 (1,11)	R=9th M=1.5455 (1)	11.3956***
54.	Reconcile check records and bank statement	R=24th M=1.6844	R=1st M=1.2561 (all)	R=2nd M=1.7799 (1,9,12)	R=12th M=1.3750 (1)	R=8th M=1.5238 (1)	R=3rd M=1.286 (1)	R=10th M=1.4138 (1)	R=4th M=1.6111 (1)	R=6th M=1.6039 (1,11)	R=9th M=1.5135 (1,2)	R=13th M=1.3636 (1)	R=14th M=1.1/50 (1,2,5, 8)	R=11th M=1.4091 (1,2)	R=7th M=1.5556 (1)	R=5th M=1.6087 (1)	10.3607***
55.	Maintain budget records	R=37th M=1.5314	R=4th M=1.5745 (6,11)	R=2nd M=1.6411 (4,6,11)	R=12th M=1.3333	R=11th M=1.3651 (2,8)	R=7th M=1.5143	R=13th M=1.1724 (1,2,8)	R=3rd M=1.6111	R=1st M=1.6623 (4,6,11)	R=8th M=1.5068 (11)	R=9th M=1.4545	R=14th M=1.1250 (1,2,8,9)	R=10th M=1.4419	R=6th M=1.5556	R=5th M=1.5652	2.3708**
56.	Prepare balance sheet	R=25th M=1.6832	R=1st M=2.4301 (all)	R=3rd M=1.8381 (1)	R=7th M=1.5000 (1)	R=9th M=1.4603 (1,2)	R=2nd M=1.8529 (1)	R=12th M=1.4138 (1,2)	R=5th M=1.6111 (1)	R=11th M=1.4487 (1,2,5, 9)	R=4th M=1.7200 (1)	R=14th M=1.1818 (1,2,5, 9)	R=13th M=1.2000 (1,2,5, 9)	R=10th M=1.4545 (1,2)	R=7th M=1.5000 (1)	R=6th M=1.5652 (1)	10.4721***
57.	Prepare income statement	R=50th M=1.3601	R=4th M=1.4681 (11)	R=3rd M=1.4833 (11)	R=9th M=1.2917	R=8th M=1.3016	R=5th M=1.3714	R=12th M=1.1724	R=2nd M=1.5000	R=7th M=1.3097 (2)	R=6th M=1.3243	R=11th M=1.2273	R=14th M=1.0769 (1,2,14)	R=10th M=1.2727	R=13th M=1.1111	R=1st M=1.5652 (11)	2.0223*
58.	Maintain petty cash and records	R=29th M=1.6257	R=1st M=2.0753 (2,3,4, 5,6,8, 9,10,11, 12,14)	R=5th M=1.6459 (1,11)	R=13th M=1.2917 (1,7)	R=10th M=1.5079 (1)	R=3rd M=1.7143 (1,11)	R=12th M=1.3448 (1,7)	R=2nd M=2.0000 (3,6,11, 12)	R=4th M=1.6731 (1,11)	R=9th M=1.5405 (1,11)	R=8th M=1.5455 (1)	R=14th M=1.1500 (1,2,5, 7,8,9)	R=11th M=1.3/21 (1,7)	R=6th M=1.6111	R=7th M=1.5652 (1)	4.7135***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
59.	Maintain customer's accounts	R=13th M=1.8470	R=1st M=2.4894 (all)	R=2nd M=2.2077 (1,3,4, 5,6,7, 8,9,10, 11,12, 13,14)	R=9th M=1.5833 (1,2)	R=7th M=1.6508 (1,2)	R=10th M=1.5152 (1,2)	R=13th M=1.4828 (1,2)	R=6th M=1.6667 (1,2)	R=8th M=1.6000 (1,2)	R=4th M=1.7297 (1,2,12)	R=11th M=1.5000 (1,2)	R=5th M=1.7250 (1,2,12)	R=14th M=1.2791 (1,2,9, 11)	R=11th M=1.5000 (1,2)	R=3rd M=1.7826 (1,2)	11.7333***
60.	Maintain inventory records	R=28th M=1.6462	R=6th M=1.7527 (6,11)	R=8th M=1.6571 (6,11)	R=4th M=1.7826 (11)	R=9th M=1.6190 (11)	R=2nd M=1.9429 (6,11)	R=13th M=1.2759 (1,2,5, 7,12)	R=1st M=2.1111 (6,8,9, 11)	R=12th M=1.5833 (7,11)	R=10th M=1.5946 (7,11)	R=11th M=1.5909	R=14th M=1.1/50 (1,2,3, 4,5,7, 8,9,12, 13,14)	R=3rd M=1.8409 (6,11)	R=5th M=1.7//8 (11)	R=7th M=1.6957 (11)	2.7860***
61.	Maintain equipment records	R=38th M=1.5284	R=7th M=1.5556 (6,11)	R=9th M=1.5311 (6,11)	R=2nd M=1.7500 (6,11)	R=12th M=1.3968	R=3rd M=1.7429 (6,11)	R=13th M=1.1724 (1,2,3, 5,7,8, 9,10,12, 14)	R=4th M=1.7222 (6,11)	R=8th M=1.5449 (6,11)	R=10th M=1.5270 (6,11)	R=1st M=1.7727 (6,11)	R=14th M=1.1250 (1,2,3, 5,7,8, 9,10,12, 14)	R=6th M=1.6512 (6,11)	R=11th M=1.4444	R=5th M=1.6957 (6,11)	2.4050**
62.	Compute postage/ freight charges	R=33rd M=1.5802	R=12th M=1.4255 (5,7,8, 11)	R=8th M=1.5286 (5,8,11)	R=13th M=1.4167 (5)	R=11th M=1.4286 (5,8,11)	R=1st M=2.7353 (all)	R=10th M=1.4828 (5)	R=2nd M=1.8889 (1,5,11)	R=3rd M=1.7051 (1,2,4, 5,11)	R=5th M=1.5753 (5,11)	R=9th M=1.5000 (5)	R=14th M=1.100 (1,2,4, 5,7,8, 9,12,14)	R=7th M=1.5465 (5,11)	R=6th M=1.5556 (5)	R=4th M=1.6087 (5,11)	8.8221***
63.	Obtain information from travel schedule	R=48th M=1.3713	R=12th M=1.2021 (5,7,8, 10)	R=11th M=1.2201 (5,7,8, 10)	R=8th M=1.2500 (7,8)	R=9th M=1.2381 (7,8,10)	R=5th M=1.4857 (7)	R=6th M=1.3571 (7,8)	R=1st M=1.2833 (all)	R=2nd M=1.6968 (7)	R=13th M=1.1892 (5,7,8, 10)	R=3rd M=1.6364 (7)	R=14th M=1.0513 (5,7,8, 10,14)	R=7th M=1.3182 (7,8)	R=10th M=1.2222 (7,8)	R=4th M=1.5217 (7)	14.6620***

Appendix C (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
64.	Use ten-key adding machine or electronic calculator	R=2nd M=2.6345	R=1st M=2.9063 (3,4,5, 6,8,9, 10,11, 12,13, 14)	R=2nd M=2.8619 (3,4,5, 8,10, 11,12, 13,14)	R=13th M=2.000 (1,2,4, 5,6,7, 8,9,11, 13)	R=8th M=2.5397 (1,2,3, 12)	R=6th M=2.6000 (1,2,3, 12)	R=5th M=2.6207 (1,3,12)	R=3rd M=2.8333 (3,10,11, 12,14)	R=7th M=2.5742 (1,2,3, 12)	R=4th M=2.6933 (1,3,12, 14)	R=10th M=2.3636 (1,2,7)	R=11th M=2.3500 (1,2,3, 7,9)	R=14th M=2.1591 (1,2,4, 5,6,7, 8,9)	R=9th M=2.4444 (1,2,3)	R=12th M=2.2727 (1,2,7, 9)	9.7585***
65.	Use computer terminals for data entry & output	R=4th M=2.5565	R=2nd M=2.8526 (5,6,8, 9,10, 11)	R=6th M=2.7129 (5,6,8, 9,11)	R=3rd M=2.8333 (5,6,8, 9,11)	R=4th M=2.7302 (5,6,8, 9,11)	R=14th M=1.8571 (1,2,3, 4,6,7, 8,9,10, 11,13, 14)	R=12th M=2.2759 (1,2,3, 4,5,7, 13)	R=1st M=3.0000 (5,6,8, 9,10,11)	R=8th M=2.4615 (1,2,3, 4,5,7, 12,13)	R=9th M=2.4189 (1,2,3, 4,5,7, 12,13)	R=10th M=2.4091 (1,5,7)	R=11th M=2.4000 (1,2,3, 4,5,7, 11,13)	R=13th M=2.0682 (1,2,3, 4,7,8, 9,11, 13,14)	R=5th M=2.7222 (5,12)	R=7th M=2.5217 (5,12)	8.5162***
66.	Use computer for solving math problems.	R=17th M=1.7628	R=2nd M=2.1075 (4,6,7, 8,9,10, 13)	R=4th M=1.8786 (6,8,9, 10,13)	R=7th M=1.7083 (7)	R=9th M=1.6190 (1,5,7)	R=3rd M=2.0286 (4,6,7, 8,9,10, 13)	R=13th M=1.3333 (1,2,5, 7)	R=1st M=2.5556 (all)	R=10th M=1.6090 (1,2,5, 7)	R=8th M=1.6216 (1,2,5, 7)	R=14th M=1.3182 (1,2,5, 7)	R=6th M=1.7750 (7)	R=11th M=1.5909 (1,7)	R=12th M=1.3889 (1,2,5, 7)	R=5th M=1.7826 (7)	5.1189***

N = Number of Responses
R = Rank Order of the Mean Ratings for each Math Skill
M = Mean of the ratings based on a scale of 1-3.

[1]Numbers in parentheses indicate which categories differ significantly in their means.

* Significant at the .05 level
** Significant at the .01 level
*** Significant at the .001 level

Appendix D

Comparison of the Employers/Supervisor's Responses by Job Category About the Importance of Math Skills Performed in Office Occupations

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
1.	Add/subtract whole numbers	R=1st M=2.8480	R=1st M=3.0000 (3)	R=7th M=2.8800	R=13th M=2.6000 (1)	R=1st M=3.0000	R=8th M=2.8571	R=12th M=2.6667	R=14th M=2.5714	R=11th M=2.7750	R=6th M=2.9000	R=8th M=2.8571	R=1st M=3.0000	R=1st M=3.0000	R=1st M=3.0000	R=10th M=2.8333	1.0275
2.	Multiply/divide whole numbers	R=2nd M=2.7368	R=6th M=2.8400 (3)	R=5th M=2.8400 (3)	R=14th M=2.3000 (1,2,4, 8,9)	R=4th M=2.8750 (3)	R=8th M=2.7143	R=11th M=2.6667	R=13th M=2.5714	R=10th M=2.7000 (3)	R=3rd M=2.9000 (3)	R=8th M=2.7143	R=1st M=3.0000	R=7th M=2.7500	R=1st M=3.0000	R=11th M=2.6667	1.0723
3.	Round off whole numbers	R=7th M=2.3099	R=11th M=2.2500	R=7th M=2.3600	R=5th M=2.4000	R=2nd M=2.5000	R=10th M=2.2857	R=9th M=2.3333	R=13th M=2.1429	r=8th M=2.3500	R=5th M=2.4000	R=4th M=2.4286	R=2nd M=2.5000	R=14th M=1.7500	R=1st M=3.0000	R=11th M=2.2500	.5679
4.	Add/subtract fractions	R=31st M=1.9006	R=5th M=1.9167	R=7th M=1.8800	R=6th M=1.9000	R=8th M=1.8750	R=4th M=1.9286	R=14th M=1.3333	R=9th M=1.8571	R=3rd M=2.0500	R=11th M=1.5000	R=9th M=1.8571	R=11th M=1.5000	R=11th M=1.5000	R=1st M=3.0000	R=2nd M=2.1667	.8026
5.	Multiply/divide fractions	R=34th M=1.8538	R=4th M=1.9583	R=7th M=1.8400	R=5th M=1.9000	R=10th M=1.6250	R=9th M=1.6429	R=8th M=1.6667	R=12th M=1.5714	R=3rd M=1.9750	R=13th M=1.5000	R=6th M=1.8571	R=13th M=1.5000	R=10th M=1.6250	R=1st M=3.0000	R=2nd M=2.2500	.9148
6.	Reduce fractions to lowest terms	R=47th M=1.5965	R=6th M=1.6250	R=5th M=1.7200	R=2nd M=1.9000	R=9th M=1.5000	R=8th M=1.5714	R=11th M=1.3333	R=14th M=1.1429 (13)	R=7th M=1.5750	R=13th M=1.2000 (13)	R=3rd M=1.8571	R=9th M=1.5000	R=12th M=1.2500	R=1st M=3.0000 (7,9)	R=4th M=1.8333	1.3463
7.	Round mixed numbers	R=30th M=1.9064	R=10th M=1.7917	R=7th M=1.8800	R=2nd M=2.3000	R=4th M=2.1250	R=5th M=2.0714	R=12th M=1.6667	R=8th M=1.8571	R=9th M=1.8500	R=11th M=1.7000	R=3rd M=2.1429	R=14th M=1.5000	R=13th M=1.6250	R=1st M=3.000	R=6th M=2.000	.6858
8.	Convert improper fractions to mixed numbers	R=52nd 1.4795	R=12th M=1.667 (3,13)	R=6th M=1.5200	R=3rd M=1.8000 (1,12)	R=7th M=1.5000	R=7th M=1.5000	R=11th M=1.3333	R=13th M=1.1429 (13)	R=5th M=1.5750	R=10th M=1.4000	R=2nd M=1.8571 (12)	R=7th M=1.5000	R=14th M=1.0000 (3,10,13)	R=1st M=3.0000 (1,7,12)	R=4th M=1.6667	1.6692

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
9.	Convert mixed numbers to improper fractions	R=55th M=1.4152	R=12th M=1.2500 (13)	R=13th M=1.2400 (13)	R=2nd M=1.8000 (12)	R=9th M=1.3750	R=10th M=1.2857 (13)	R=3rd M=1.6667	R=10th M=1.2857	R=6th M=1.5250	R=8th M=4.0000	R=5th M=1.5714	R=7th M=1.5000	R=14th M=1.0000 (3,13)	R=1st M=3.000 (1,2,5, 12)	R=3rd M=1.6667	1.4182
10.	Convert fractions to decimals/vice versa	R=27th M=1.9415	R=10th M=1.7083	R=6th M=2.0400	R=2nd M=2.3000	R=8th M=1.8750	R=7th M=2.0000	R=11th M=1.6667	R=9th M=1.8571	R=5th M=2.0500	R=13th M=1.5000	R=3rd M=2.1429	R=13th M=1.5000	R=12th M=1.6250	R=1st M=3.0000	R=4th M=2.0833	1.0976
11.	Convert fractions to percents/vice versa	R=20th M=2.0526	R=13th M=1.7083 (8)	R=7th M=2.1600 (12)	R=5th M=2.3000 (12)	R=11th M=1.8750	R=8th M=2.0000	R=8th M=2.0000	R=8th M=2.0000	R=6th M=2.2250 (1,12)	R=12th M=1.8000	R=3rd M=2.4286 (12)	R=2nd M=2.5000	R=14th M=1.2500 (2,3,8, 10,14)	R=1st M=3.0000	R=4th M=2.3333 (12)	1.6863
12.	Add/subtract decimals	R=5th M=2.4386	R=3rd M=2.7083 (12)	R=5th M=2.6000	R=11th M=2.1000	R=7th M=2.3750	R=4th M=2.6429	R=13th M=2.0000	R=9th M=2.2857	R=6th M=2.4500	R=11th M=2.1000	R=9th M=2.2857	R=1st M=3.0000	R=13th M=2.0000 (1)	R=1st M=3.0000	R=8th M=2.3333	1.2812
13.	Multiply/divide decimals	R=12th M=2.1988	R=7th M=2.2500	R=4th M=2.4000 (12)	R=10th M=2.0000	R=12th M=1.8750	R=3rd M=2.4286 (12)	R=13th M=1.6667	R=5th M=2.2857	R=8th M=2.2250	R=10th M=2.0000	R=5th M=2.2857	R=1st M=3.0000	R=14th M=1.5000 (2,5)	R=1st M=3.0000	R=9th M=2.1667	1.1596
14.	Multiply by 10, 100, etc.	R=8th M=2.2749	R=6th M=2.3333	R=3rd M=2.5600	R=9th M=2.2000	R=13th M=1.8750	R=5th M=2.4286	R=6th M=2.3333	R=11th M=2.0000	R=8th M=2.2750	R=12th M=1.9000	R=4th M=2.4286	R=1st M=3.0000	R=13th M=1.8750	R=1st M=3.0000	R=10th M=2.1667	1.1043
15.	Divide by 10, 100, etc.	R=10th M=2.2339	R=5th M=2.2917 (12)	R=3rd M=2.4800 (12)	R=4th M=2.3000	R=7th M=2.2500	R=9th M=2.2143	R=12th M=2.0000	R=13th M=1.8571	R=7th M=2.2500 (12)	R=11th M=2.1000	R=6th M=2.2857	R=1st M=3.0000	R=14th M=1.5000 (1,2,8)	R=1st M=3.0000	R=10th M=2.1667	1.0659
16.	Round off decimals to one or more places.	R=10th M=2.2339	R=9th M=2.2917 (12)	R=5th M=2.4000 (12)	R=8th M=2.3000 (12)	R=2nd M=2.5000 (12)	R=10th M=2.2143 (12)	R=6th M=2.3333	R=13th M=1.8571	R=7th M=2.3250 (12)	R=11th M=2.0000	R=4th M=2.4286 (10)	R=2nd M=2.5000	R=14th M=1.3750 (1,2,3, 4,5,8, 10)	R=1st M=3.0000	R=11th M=2.0000	1.3956

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
17.	Convert decimals to percents/visa versa	R=14th M=2.1170	R=10th M=2.0833	R=9th M=2.1200	R=5th M=2.3000	R=6th M=2.2500	R=12th M=2.0000	R=4th M=2.3333	R=13th M=1.8571	R=8th M=2.1500	R=7th M=2.2000	R=3rd M=2.4286	R=2nd M=2.5000	R=14tn M=1.5000	R=1st M=3.0000	R=10tn M=2.0833	.7421
18.	Find what percent one number is of another.	R=9th M=2.2398	R=9th M=2.1250 (12)	R=5th M=2.4400 (12)	R=6th M=2.400 (12)	R=9th M=2.1250	R=12th M=1.9286 (10)	R=11th M=2.0000	R=13th M=1.8571 (10)	R=7th M=2.3000 (12)	R=7th M=2.3000 (12)	R=2nd M=2.8571 (5,7,12)	R=3rd M=2.5000	R=14th M=1.3/50 (1,2,3, 8,9,10, 14)	R=1st M=3.0000	R=3rd M=2.5000 (12)	1.8633*
19.	Find a number when a percent is known	R=16th M=2.0936	R=12th M=1.7917 (2,14)	R=4th M=2.3200 (1,12)	R=5th M=2.3000	R=6th M=2.1250	R=9th M=2.0000	R=9th M=2.0000	R=13th M=1.7143	R=8th M=2.0750	R=7th M=2.1000	R=2nd M=2.5714 (12)	R=9th M=2.0000	R=14tn M=1.5000 (2,10,14)	R=1st M=3.0000	R=3rd M=2.5000 (1,12)	1.5786
20.	Use Ratios	R=40th M=1.6842	R=12th M=1.3750 (3,14)	R=8th M=1.6800	R=2nd M=2.1000 (1)	R=10th M=1.6250	R=7th M=1.7857	R=1st M=2.3333	R=5th M=1.8571	R=9th M=1.6750	R=14th M=1.3000	R=5th M=1.8571	R=11th M=1.5000	R=12th M=1.3/50	R=4th M=2.0000	R=3rd M=2.0833 (1)	1.2736
21.	Average Numbers	R=13th M=2.1287	R=13th M=1.6667 (2,3,8, 10)	R=4th M=2.3600 (1,7)	R=2nd M=2.5000 (1,7)	R=8th M=2.1250	R=10th M=2.0714	R=5th M=2.3333	R=14th M=1.5714 (2,3,10)	R=7th M=2.2000 (1)	R=9th M=2.1000	R=1st M=2.7143 (1,7,12)	R=2nd M=2.5000	R=12th M=1.7500 (10)	R=11th M=2.0000	R=6th M=2.2500	1.9612*
22.	Square a number	R=61st M=1.2515	R=12th M=1.0417 (3,14)	R=11th M=1.2000	R=2nd M=1.6000 (1,9)	R=5th M=1.3750	R=10th M=1.2143	R=13th M=1.0000	R=6th M=1.2857	R=8th M=1.2750	R=13th M=1.0000 (3)	R=6th M=1.2857	R=3rd M=1.5000	R=9th M=1.2500	R=1st M=2.0000	R=3rd M=1.5000 (1)	1.3891
23.	Find square root	R=62nd M=1.1988	R=12th M=1.0417 (3,14)	R=11th M=1.1200	R=2nd M=1.5000 (1,9)	R=7th M=1.2500	R=8th M=1.2143	R=13th M=1.0000	R=5th M=1.2857	R=9th M=1.1750	R=13th M=1.0000 (3,14)	R=5th M=1.2857	R=2nd M=1.5000	R=10th M=1.1250	R=1st M=2.0000	R=2nd M=1.5000 (1,9)	1.4774
24.	Read a number	R=27th M=1.9415	R=13th M=1.4583 (3,5,8, 10,14)	R=10th M=1.8400	R=3rd M=2.3000 (1)	R=9th M=1.8750	R=1st M=2.3571 (1,7,9)	R=7th M=2.0000	R=14th M=1.4286 (5,14)	R=6th M=2.0750 (1)	R=11th M=1.5000 (5,14)	R=4th M=2.2857 (1)	R=11th M=1.5000	R=5th M=2.1250	R=7th M=2.0000	R=2nd M=2.3333 (1,7,9)	2.2912**

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
25.	Interpret graphs & tables	R=39th M=1.6959	R=11th M=1.3333 (3,8,10, 14)	R=9th M=1.7200	R=3rd M=2.1000 (1,12)	R=7th M=1.8750	R=10th M=1.5000	R=14th M=1.0000	R=12th M=1.2857	R=8th M=1.7750 (1)	R=6th M=1.9000	R=2nd M=2.1429 (1)	R=1st M=2.5000	R=13th M=1.2500 (3)	R=4th M=2.0000	R=4th M=2.0000 (1)	2.0236*
26.	Compute area of simple geometric figures	R=63rd M=1.1930	R=9th M=1.1250 (14)	R=11th M=1.1200 (14)	R=5th M=1.4000	R=12th M=1.0000 (14)	R=6th M=1.2857	R=12th M=1.0000	R=8th M=1.1429	R=7th M=1.1500 (14)	R=12th M=1.0000 (14)	R=4th M=1.4286	R=2nd M=1.5000	R=9th M=1.1250	R=1st M=2.0000	R=2nd M=1.5000 (1,2,4, 8,9)	1.6052
27.	Compute area of complex geometric figures	R=66th M=1.0936	R=7th M=1.0417 (14)	R=8th M=1.0400 (14)	R=3rd M=1.2000	R=9th M=1.0000	R=4th M=1.1429	R=9th M=1.0000	R=9th M=1.0000	R=6th M=1.1000	R=9th M=1.0000 (14)	R=4th M=1.1429	R=1st M=1.5000	R=9th M=1.0000	R=9th M=1.0000	R=2nd M=1.3333 (1,2,9)	1.1796
28.	Compute volume of geometric solids	R=64th M=1.1228	R=9th M=1.0417 (14)	R=8th M=1.0800 (14)	R=3rd M=1.3000	R=10th M=1.0000	R=5th M=1.1429	R=10th M=1.0000	R=5th M=1.1429	R=7th M=1.0000 (14)	R=10th M=1.0000 (14)	R=4th M=1.2857	R=1st M=1.5000	R=10th M=1.0000	R=10th M=1.0000	R=2nd M=1.4167 (1,2,8,9)	1.2655
29.	Compute volume of complex geometric solids	R=65th M=1.1053	R=8th M=1.0417 (14)	R=9th M=1.0000 (14)	R=5th M=1.2000	R=9th M=1.0000	R=6th M=1.1429	R=9th M=1.0000	R=3rd M=1.2857	R=7th M=1.1000	R=9th M=1.0000	R=3rd M=1.2857	R=1st M=1.5000	R=9th M=1.0000	R=9th M=1.0000	R=2nd M=1.3333 (1,2)	1.3407
30.	Use equations or formulas	R=42nd M=1.6725	R=5th M=1.7500	R=3rd M=1.8000	R=1st M=2.1000 (12)	R=11th M=1.5000	R=4th M=1.7857	R=8th M=1.6667	R=13th M=1.4286	R=10th M=1.5750	R=7th M=1.7000	R=6th M=1.7143	R=11th M=1.5000	R=14th M=1.2500 (3)	R=2nd M=2.0000	R=9th M=1.5833	.7415
31.	Solve problems of length, width, and/ or height	R=50th M=1.5439	R=13th M=1.2083 (3,5,7, 13,14)	R=12th M=1.3600 (5,13)	R=4th M=1.8000 (1)	R=11th M=1.3750 (13)	R=3rd M=1.9286 (1,2,9)	R=7th M=1.6667	R=2nd M=2.0000 (1,9)	R=9th M=1.5500	R=14th M=1.2000 (5,7,13)	R=8th M=1.5714	R=10th M=1.5000	R=5th M=1.7500	R=1st M=3.0000 (1,2,4, 9)	R=5th M=1.7500 (1)	2.2871**

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
32.	Solve problems involving time	R=25th M=1.9649	R=13th M=1.6250 (3,5,7)	R=9th M=1.8800 (7)	R=2nd M=2.5000 (1,6)	R=10th M=1.8750 (7)	R=4th M=2.2857 (1,6)	R=14th M=1.0000 (3,5,7)	R=1st M=2.8571 (1,2,4, 6,8,9, 12,14)	R=7th M=1.9750 (7)	R=12th M=1.7000 (7)	R=5th M=2.1429	R=2nd M=2.5000	R=11th M=1.7500 (7)	R=6th M=2.0000	R=8th M=1.9167 (7)	2.1196*
33.	Solve problems involving weight	R=54th M=1.4503	R=14th M=1.0833 (5,7,10, 12)	R=11th M=1.2800 (5,7,12)	R=6th M=1.5000 (5,7)	R=6th M=1.5000 (5,7)	R=2nd M=2.1429 (1,2,3, 4,8,9, 14)	R=9th M=1.3333 (7)	R=1st M=2.5714 (1,2,3, 4,6,8, 9,14)	R=10th M=1.3000 (5,7,12)	R=13th M=1.1000 (5,7,10, 12)	R=5th M=1.8571 (1,9)	R=6th M=1.5000	R=4th M=1.8750 (1,2,8, 9)	R=3rd M=2.0000	R=12th M=1.2500 (5,7)	4.7881***
34.	Solve problems involving distance	R=53th M=1.4737	R=13th M=1.0833 (5,7,10)	R=10th M=1.3600 (5,7)	R=6th M=1.5000	R=11th M=1.2500 (5,7)	R=2nd M=2.0714 (1,2,4, 8,9)	R=14th M=1.0000 (7)	R=1st M=2.2857 (1,2,4, 8,9)	R=9th M=1.4500 (5,7)	R=12th M=1.1000 (5,7,10)	R=3rd M=2.0000 (1,9)	R=6th M=1.5000	R=6th M=1.5000	R=3rd M=2.0000	R=5th M=1.5833	2.8528***
35.	Converting English units to metric units/visa versa	R=58th M=1.3626	R=14th M=1.0833 (5,7,13, 14)	R=12th M=1.1600 (5,7,13)	R=6th M=1.5000 (13)	R=11th M=1.2500 (7,13)	R=3rd M=1.6429 (1,2,9, 13)	R=10th M=1.3333 (13)	R=2nd M=2.0000 (1,2,4, 8,9)	R=9th M=1.3500 (7,13)	R=13th M=1.1000 (5,7,13)	R=5th M=1.5714 (13)	R=6th M=1.5000	R=8th M=1.3750 (13)	R=1st M=3.0000 (1,2,3, 4,5,6, 8,9,10, 12,14)	R=4th M=1.5833 (1,13)	2.8736***
36.	Mental estimation	R=15th M=2.1462	R=5th M=2.2083	R=9th M=2.0800	R=3rd M=2.4000	R=13th M=1.8750	R=7th M=2.1429	R=10th M=2.0000	R=2nd M=2.5714	R=6th M=2.1500	R=8th M=2.1000	R=12th M=1.8571	R=14th M=1.5000	R=10th M=2.0000	R=1st M=3.0000	R=4th M=2.2500	.6865
37.	Compute simple/ compound interest	R=29th M=1.9298	R=2nd M=2.4583 (5,7,8, 9,11,12)	R=3rd M=2.2400 (5,9)	R=4th M=2.2000	R=7th M=2.7500	R=11th M=1.5000 (1,2)	R=13th M=1.3333	R=10th M=1.5714 (1)	R=5th M=1.9250 (1)	R=12th M=1.4000 (1,2)	R=8th M=1.7143	R=14th M=1.0000 (1,2)	R=9th M=1.6250 (1)	R=1st M=3.0000	R=6th M=1.8333	2.4136**

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
38.	Compute simple/ compound interest from table	R=43rd M=1.6550	R=2nd M=2.1667 (3,5,7, 8,9,12)	R=3rd M=1.8800 (5,9)	R=9th M=1.5000 (1)	R=5th M=1.7500	R=12th M=1.2143 (1,2,13)	R=6th M=1.6667	R=10th M=1.4286 (1)	R=8th M=1.6250 (1,8)	R=13th M=1.0000 (1,2,8, 10,13)	R=4th M=1.8571 (9)	R=14th M=1.0000	R=11th M=1.2500 (1)	R=1st M=3.0000 (5,9)	R=6th M=1.6667	2.9084***
39.	Compute trade and cash discount	R=38th M=1.7368	R=10th M=1.5833 (4)	R=5th M=2.0800 (5,8)	R=6th M=1.9000	R=2nd M=2.3750 (1,5,8, 12)	R=13th M=1.2857 (2,4)	R=3rd M=2.3333	R=4th M=2.1429	R=9th M=1.6000 (2,4)	R=11th M=1.5000	R=7th M=1.8571	R=14th M=1.0000	R=12th M=1.3750 (4)	R=1st M=3.0000	R=8th M=1.7500	2.0438*
40.	Compute sales tax	R=37th M=1.7544	R=9th M=1.7917	R=8th M=1.8400 (5)	R=5th M=2.0000	R=4th M=2.1250 (5)	R=12th M=1.2143 (2,4,7, 10)	R=5th M=2.0000	R=2nd M=2.5714 (5,8,9, 12)	R=10th M=1.6500 (7)	R=13th M=1.2000 (7,10)	R=3rd M=2.2857 (5,9)	R=14th M=1.0000	R=11th M=1.3750 (7)	R=1st M=3.0000	R=7th M=1.9167	2.1873*
41.	Prepare sales slips and/or invoices	R=36th M=1.8012	R=9th M=1.7500	R=5th M=1.8400	R=8th M=1.8000	R=1st M=2.2500	R=12th M=1.5714	R=11th M=1.6667	R=2nd M=2.1429	R=7th M=1.8250	R=13th M=1.5000	R=4th M=1.8571	R=13th M=1.5000	R=9th M=1.7500	R=3rd M=2.0000	R=6th M=1.8333	.4316
42.	Compute a job cost	R=45th M=1.6433	R=13th M=1.2083 (4)	R=7th M=1.6800	R=3rd M=1.9000	R=2nd M=2.1250 (1)	R=6th M=1.7857	R=1st M=2.3333	R=4th M=1.8571	R=8th M=1.6500	R=12th M=1.4000	R=9th M=1.5714	R=10th M=1.5000	R=10th M=1.5000	R=14th M=1.0000	R=5th M=1.8333	1.2992
43.	Compute cost of goods sold	R=51st M=1.5380	R=11th M=1.1667 (3,4,5, 7)	R=8th M=1.4400 (4)	R=3rd M=2.0000 (1,9)	R=1st M=2.2500 (1,2,8, 9)	R=5th M=1.9286 (1,9)	R=3rd M=2.0000	R=2nd M=2.1429 (1,9)	R=6th M=1.5000 (4)	R=12th M=1.1000 (3,4,5, 7)	R=9th M=1.4286	R=12th M=1.0000	R=10th M=1.3750	R=12th M=1.0000	R=6th M=1.5000	2.4949**
44.	Compute selling price	R=46th M=1.6023	R=12th M=1.1667 (2,4,5, 7)	R=6th M=1.7600 (1)	R=7th M=1.6000	R=3rd M=2.3750 (1,8,9)	R=5th M=1.8571 (1)	R=4th M=2.0000	R=2nd M=2.4286 (1,8,9)	R=9th M=1.5250 (4,7)	R=13th M=1.1000 (2,4,5, 7)	R=11th M=1.4286	R=14th M=1.0000	R=10th M=1.5000	R=1st M=3.0000	R=8th M=1.5833	2.6108**
45.	Compute net sales	R=48th M=1.5673	R=12th M=1.2083 (4,5,6)	R=5th M=1.6800	R=4th M=1.8000	R=2nd M=2.0000 (1)	R=2nd M=2.0000 (1)	R=10th M=1.3333 (1)	R=1st M=2.1429	R=8th M=1.4500	R=11th M=1.3000	R=7th M=1.5714	R=13th M=1.0000	R=9th M=1.3750	R=13th M=1.0000	R=6th M=1.6667	1.6470*

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
46.	Solve markup problem	R=59th M=1.3333	R=12th M=1.0833 (4)	R=5th M=1.4400	R=4th M=1.5000	R=1st M=1.7500 (1)	R=7th M=1.3571	R=8th M=1.3333	R=2nd M=1.7143	R=10th M=1.2250	R=11th M=1.1000	R=6th M=1.4286	R=13th M=1.0000	R=9th M=1.2500	R=13th M=1.0000	R=3rd M=1.5833	1.2006
47.	Solve markdown problems	R=60th M=1.3216	R=11th M=1.0833 (4)	R=6th M=1.4000	R=4th M=1.5000	R=1st M=1.7500 (1)	R=8th M=1.2857	R=12th M=1.0000	R=2nd M=1.7143	R=9th M=1.2250	R=10th M=1.1000	R=5th M=1.4286	R=12th M=1.0000	R=7th M=1.3750	R=12th M=1.0000	R=3rd M=1.5833	1.2367
48.	Solve finance charge and annual percentage rate	R=44th M=1.6491	R=1st M=2.1667 (4,5,6, 8,9,12)	R=2nd M=2.0400 (5,9,12)	R=5th M=1.6000	R=8th M=1.3750 (1)	R=9th M=1.1429 (1,2)	R=12th M=1.0000 (1)	R=7th M=1.4286	R=4th M=1.6750 (1)	R=11th M=1.1000 (1,2)	R=6th M=1.5714	R=12th M=1.0000	R=10th M=1.1250 (1,2)	R=2nd M=1.0000	R=3rd M=1.8333	2.8981***
49.	Compute depreciation	R=57th M=1.3684	R=9th M=1.2083 (2)	R=1st M=1.8000 (1,5,7, 8,9)	R=3rd M=1.6000	R=7th M=1.2500	R=11th M=1.0714 (2,14)	R=5th M=1.3333	R=10th M=1.1429 (2)	R=4th M=1.3750 (2)	R=12th M=1.0000 (2,14)	R=6th M=1.2857	R=12th M=1.0000	R=7th M=1.2500	R=12th M=1.0000	R=2nd M=1.6667 (5,9)	2.0055*
50.	Compute time cards for regular and overtime hours	R=6th M=2.3743	R=9th M=2.3333	R=6th M=2.4400	R=4th M=2.5000	R=4th M=2.5000	R=7th M=2.4286	R=14th M=1.6667	R=11th M=2.1429	R=8th M=2.3500	R=2nd M=2.7000	R=3rd M=2.5714	R=1st M=3.0000	R=12th M=2.0000	R=12th M=2.0000	R=10th M=2.2500	.7460
51.	Compute salaries/ complete payroll records	R=26th M=1.9591	R=12th M=1.4583 (2,8,14)	R=3rd M=2.2000 (1)	R=6th M=2.0000	R=8th M=1.7500	R=5th M=2.0714	R=10th M=1.6667	R=9th M=1.7143	R=2nd M=2.2250 (1)	R=7th M=1.8000	R=4th M=2.1429	R=13th M=1.0000	R=11th M=1.6250	R=13th M=1.0000	R=1st M=2.2500 (1)	1.7058
52.	Compute commission	R=56th M=1.3918	R=11th M=1.1250 (7)	R=6th M=1.4800	R=5th M=1.5000	R=2nd M=1.7500	R=12th M=1.0000 (7)	R=3rd M=1.6667	R=1st M=2.0000 (1,5)	R=7th M=1.4500	R=8th M=1.3000	R=9th M=1.2857	R=12th M=1.0000	R=10th M=1.2500	R=12th M=1.0000	R=4th M=1.5833	1.4259

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
53.	Prepare checks, deposit, and check register	R=17th M=2.0643	R=2nd M=2.6667 (3,4,5, 8,9,10, 11,12,14)	R=4th M=2.3200 (9,12)	R=10th M=1.7000 (1,7)	R=9th M=1.7500 (1)	R=6th M=2.0000 (1,12)	R=3rd M=2.3333 (12)	R=1st M=2.7143 (3,9,11, 12)	R=5th M=2.1000 (1,9,12)	R=11th M=1.4000 (1,2,7, 8)	R=8th M=1.8571 (1)	R=12th M=1.0000 (1,2,5, 6,7,8, 14)	R=12th M=1.0000 (1,2,5, 6,7,8, 14)	R=12th M=1.0000	R=6th M=2.0000 (1,12)	3.7096***
54.	Reconcile check records and bank statement	R=21st M=2.0409	R=1st M=2.5833	R=3rd M=2.5200	R=7th M=1.8000 (1,2)	R=9th M=1.5000 (1,2,7)	R=6th M=1.9286 (1,2)	R=11th M=1.0000 (1,2,7)	R=2nd M=2.5714	R=4th M=2.1250 (1)	R=10th M=1.4000 (1,2,7, 8)	R=8th M=1.7143 (1,2)	R=11th M=1.0000 (1,2,7)	R=11th M=1.0000 (1,2,5, 5,7,8, 12)	R=11th M=1.0000	R=5th M=2.0000	4.4993***
55.	Maintain budget records	R=23rd M=2.0058	R=11th M=1.6250 (8,14)	R=5th M=2.1600	R=9th M=1.9000	R=11th M=1.6250	R=3rd M=2.2143	R=10th M=1.6667	R=6th M=2.0000	R=4th M=2.1750 (1,12)	R=6th M=2.0000	R=1st M=2.4286 (12)	R=14th M=1.0000	R=13th M=1.3750 (8,10,14)	R=6th M=2.0000	R=2nd M=2.4167 (1,12)	1.7015
56.	Prepare balance sheet	R=35th M=1.8363	R=7th M=1.9583	R=2nd M=2.1200 (9)	R=3rd M=2.0000	R=8th M=1.7500	R=3rd M=2.0000	R=12th M=1.0000	R=3rd M=2.0000	R=9th M=1.7250	R=11th M=1.3000 (2)	R=1st M=2.1429	R=12th M=1.0000	R=10th M=1.3750	R=12th M=1.0000	R=3rd M=2.0000	1.4845
57.	Prepare income statement	R=49th M=1.5497	R=8th M=1.3750 (2)	R=2nd M=1.9600 (1,8,9)	R=3rd M=1.9000 (9)	R=5th M=1.5000	R=5th M=1.5000	R=9th M=1.3333	R=1st M=2.0000 (9)	R=7th M=1.4750 (2)	R=12th M=1.1000 (2,3,7)	R=10th M=1.2857	R=13th M=1.0000	R=11th M=1.2500	R=13th M=1.0000	R=4th M=1.7500	1.7381
58.	Maintain petty cash and records	R=24th M=1.9883	R=2nd M=2.2917 (9,12)	R=3rd M=2.2400 (9,12)	R=7th M=1.9000	R=11th M=1.6250	R=5th M=2.0000	R=10th M=1.6667	R=1st M=2.4286 (9,12)	R=4th M=2.1250 (9,12)	R=12th M=1.3000 (1,2,7, 8)	R=8th M=1.8571	R=14th M=1.0000	R=13th M=1.2500 (1,2,7, 8)	R=5th M=2.0000	R=9th M=1.8333	2.0801*

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Stero	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
59.	Maintain customers' accounts	R=16th M=2.0936	R=1st M=2.5000 (9,12)	R=2nd M=2.4800 (9,12)	R=4th M=2.2000	R=7th M=2.0000	R=6th M=2.1429 (9)	R=11th M=1.6667	R=3rd M=2.2857	R=7th M=2.0000 (9)	R=13th M=1.30000 (1,2,5, 8)	R=10th M=1.7143	R=7th M=2.0000	R=12th M=1.3750 (1,2)	R=14th M=1.0000	R=5th M=2.1667	2.1437*
60.	Maintain inventory records	R=22nd M=2.0292	R=10th M=1.9167	R=5th M=2.2400	R=1st M=2.5000	R=6th M=1.7500	R=3rd M=2.3571	R=6th M=2.0000	R=2nd M=2.4286	R=11th M=1.8500	R=12th M=1.8000	R=6th M=2.0000	R=14th M=1.0000	R=13th M=1.6250	R=6th M=2.0000	R=4th M=2.2500	1.2989
61.	Maintain equipment records	R=18th M=2.0643	R=12th M=1.8333 (3)	R=4th M=2.3200	R=1st M=2.6000 (1,4)	R=13th M=1.6250 (3)	R=3rd M=2.3571	R=6th M=2.0000	R=2nd M=2.4286	R=10th M=1.9250	R=6th M=2.0000	R=5th M=2.1429	R=14th M=1.5000	R=11th M=1.8750	R=6th M=2.0000	R=6th M=2.0000	1.2088
62.	Compute postage/ freight charges	R=32nd M=1.8772	R=11th M=1.5000 (5,8)	R=4th M=2.0000 (5,9)	R=7th M=1.8000 (5)	R=8th M=1.7500 (5)	R=1st M=2.8571 (1,2,3, 4,6,8, 9,10,11, 12,14)	R=12th M=1.3333 (5)	R=2nd M=2.2857 (9)	R=3rd M=2.0500 (1,5,9)	R=13th M=1.2000 (2,5,7,	R=6th M=1.8571 (5)	R=14th M=1.0000 (5)	R=9th M=1.6250 (5)	R=4th M=2.0000	R=10th M=1.5833 (7)	3.5659***
63.	Obtain information from travel schedule	R=41st M=1.6784	R=13th M=1.1250 (7,8,10)	R=10th M=1.4400 (7,8,10)	R=6th M=1.6000 (7,10)	R=7th M=1.5000 (7,10)	R=11th M=1.4286 (7,8,10)	R=5th M=1.6667	R=1st M=2.5714 (1,2,3, 4,5,9, 12,14)	R=3rd M=2.1250 (1,2,5, 9)	R=12th M=1.3000 (7,8,10)	R=1st M=2.5714 (1,2,3, 4,5,9, 12,14)	R=7th M=1.5000	R=7th M=1.5000 (7,10)	R=14th M=1.0000	R=4th M=1.7500 (7,10)	4.2134***
64.	Use ten key adding machine or electronic calculator	R=2nd M=2.7368	R=4th M=2.9167 (12)	R=1st M=3.0000 (5,8,12)	R=11th M=2.6000	R=5th M=2.8750	R=13th M=2.5714 (2)	R=9th M=2.6667	R=7th M=2.7143	R=10th M=2.6250 (2)	R=8th M=2.7000	R=6th M=2.8571	R=1st M=3.0000	R=14th M=2.3750 (1,2)	R=1st M=3.0000	R=12th M=2.5833	1.4910

Appendix D (continued)

Item No.	Basic Math Skills	Total N=854	Bank Teller	Bkk/Acct	Computer Operator	Data Entry	Postal	Receptionist	Reservation	Secretary	Stat Clerk	Steno	Telephone Operator	Shipping Clerk	Typist	Other	F Ratio
65.	Use computer terminals for data entry and output	R=4th M=2.6140	R=9th M=2.6667 (5)	R=6th M=2.8400 (5)	R=7th M=2.8000 (5)	R=1st M=3.0000 (5)	R=14th M=1.7857 (1,2,3, 4,6,7, 8,9,10, 12,14)	R=1st M=3.000 (5)	R=8th M=2.7143 (5)	R=11th M=2.5500 (5)	R=10th M=2.6000 (5)	R=5th M=2.8571 (5)	R=1st M=33.0000	R=12th M=2.5000 (5)	R=1st M=3.0000	R=12th M=2.5000 (5)	2.2638**
66.	Use computer for solving math problems	R=33rd M=1.8655	R=4th M=2.0000	R=8th M=1.9600	R=1st M=2.3000	R=9th M=1.8750	R=12th M=1.5714	R=4th M=2.0000	R=3rd M=2.1429	R=10th M=1.7250	R=11th M=1.6000	R=2nd M=2.2857	R=13th M=1.5000	R=14th M=1.3750	R=4th M=2.0000	R=4th M=2.0000	.9697

N = Number of Responses
R = Rank Order of the Mean Ratings for each Math Skill
M = Mean of the ratings based on a scale of 1-3.

[1]Numbers in parentheses indicate which categories differ significantly in their means.

* Significant at the .05 level
** Significant at the .01 level
*** Significant at the .001 level